

# Municipal Journal

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## RECLAIMING OLD MACADAM ROADWAYS

More Reliable as Base for Bituminous Top Than New Broken Stone Base—Detailed Cost of Putting a Two-Inch Surface on a Four Year Old Macadam—Treatment of Shoulders.

Of all road improvement problems, by far the most universal and therefore the most important is the best method of providing old macadam highways with wearing surfaces that will carry present-day traffic. To throw away existing investment in stone roads is uneconomical and unnecessary because, *regarded as foundations*, they have a high value. Macadam that has been in existence for three or four years has reached a condition of stability superior to that of a new broken-stone base; for defects in drainage and unfavorable subsoil conditions have become plainly evident and can be remedied. The breaking down of support—such as is too often observed in connection with surfaces on new broken-stone base—can be prevented almost entirely when old macadam is

road to receive a new asphalt surface, it should be done as superficially as possible in order to avoid all unnecessary disturbance of the bond of the old road.

The following conditions prevailed with respect to the actual resurfacing of three miles of four-year-old macadam with a 2-inch mixed top: The work was located two miles from the freight siding at which stone was received and where there was placed a portable asphalt mixing plant with a capacity of 1,000 sq. yds. of 2-inch top per day of ten hours. Labor cost \$2.50 per day and \$6 per day was paid for teams. The asphalt cement cost \$28 per ton delivered. Stone on the siding cost \$1.35 per ton; sand \$1 per ton, plus 10 cents per ton for handling from the cars to the plant.



PREPARING OLD MACADAM ROAD FOR RESURFACING.  
Preliminary treatment of shoulders, to be rolled and carpet coated.

used as the foundation for new mixed-method or penetration bituminous tops. Resurfacing with such tops can be recommended on the basis both of successful experience and of cost.

Successful work of this description presupposes the existence of what was in the first instance a well-bonded and well-drained macadam. It may have raveled on the surface and developed pot holes here and there, but the greater part of the original road remains.

Starting with such a foundation, it is only necessary to fill such holes, depressions or ruts as may exist, to remove all loose stones from the surface, and conform the latter to the crown desired for the finished road. While the crown of plain macadam is usually higher than is desirable for asphalt wearing surfaces, the crown generally wears down more rapidly than the sides and it is rarely necessary, after macadam has been in use for a number of years, to cut away excessive crown. When scarifying is desirable to facilitate the preparation of an old stone

The condition of the road resurfaced may be described as fair. It was necessary to scarify some sections and to bring depressions to grade by the addition of new stone. The cost of preparing the old road for resurfacing was 15 cents per sq. yd.

The aggregate consisted of 70 per cent of stone, ranging from 1½-inch down to dust, and 30 per cent of sand. There was added to it 17½ pounds of asphalt binder per square yard of 2-inch top. A careful analysis of the cost of the work gives this result:

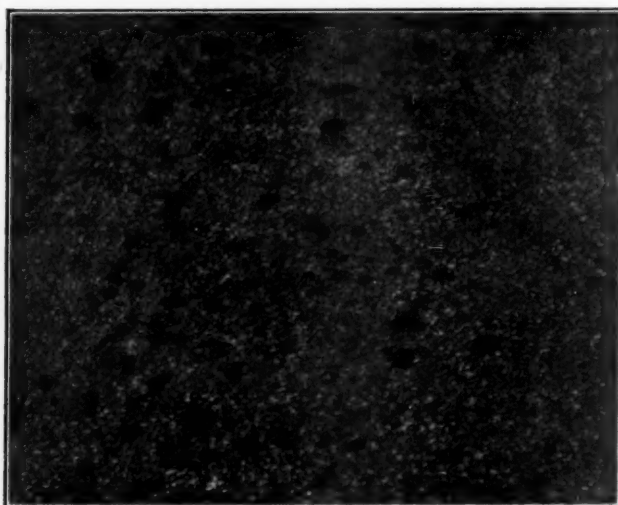
Sand .....	\$0.04 per sq. yd.
Stone .....	.10 "
Asphalt .....	.245 "
Mixing .....	.035 "
Hauling .....	.05 "
Laying and Railing.....	.055 "
Fuel .....	.025 "
Superintendence, tools, insurance, repairs, plant site and sundries.....	.19 "
	<hr/> \$0.74 "

Computed on the same basis of labor and material cost, an all-stone asphalt macadam top *with* a seal coat would cost about the same as the sand-and-stone mix *without* a seal coat.

The hot mixture was hauled in horse-drawn wagons and dumped on a metal sheet, from which it was spread on the old road surface to such depth that when thoroughly rolled it had a thickness of 2 inches. The appearance of the finished road after three years' wear is shown by the accompanying photographs.

In this instance, which is typical of a great many resurfacing jobs, the township changed a dusty and rapidly disintegrating macadam road into a moderately smooth, resilient, durable wearing surface, which to all appearances has many years of life ahead of it, at a cost of \$8,130.87 per mile of 14-foot road, this figure including the contractor's profit and cost of preparing the old road for resurfacing. The traffic on the road consists of several hundred farm wagons and automobiles per day. The only maintenance required has been on the unpaved shoulders.

While it was unnecessary, and as to part of the road impossible, in the case here referred to, to extend the shoulders, excellent practice in construction of this kind is to use old or new stone to build up shoulders to the level of, and conforming to the crown of, the new wearing surface and apply a light penetration or carpet coat of asphalt. This makes it safer for teams and motors to turn off of the road proper and also serves the highly desirable purpose of carrying drainage as far as possible from the road. Such carefully constructed shoulders meet the requirement for wider roads for fast-moving traffic and avoid the danger that is inseparable from building out a broken stone base from an old macadam road with the purpose of resurfacing the widened roadway with a continuous top coat. Unless this is very carefully done, there will be breaks between the old and new base, resulting in corresponding breaks in the wearing surface. Only when there is a large quantity of old stone obtainable from the road to be resurfaced does it pay to attempt to use this stone in the new top. To make such salvaged stone suitable for use it would have to be screened and probably, in part, to be crushed.



CLOSE VIEW OF SURFACE OF ROAD AFTER THREE YEARS' WEAR.

## HOW SEWAGE PLANTS ARE OPERATING

### Conditions Found on Inspection of Fourteen Sewage Treatment Plants—Satisfactory Results from Imhoff Tanks and Filters—Activated Sludge.

An inspection of a number of sewage treatment plants was made last year in behalf of the cities of Pasadena, South Pasadena and Alhambra, Calif., by T. D. Allin and R. V. Orbison, commissioner of public works and city engineer, respectively, of Pasadena. The plants visited were those at Houston, Tex.; Atlanta, Ga.; Baltimore, Philadelphia, Plainfield, N. J.; Fitchburg, Brocton and Worcester, Mass.; Rochester and Batavia, N. Y.; Cleveland, Columbus, Canton and Mt. Vernon, O.; Chicago, Milwaukee and Mason City, Iowa. Their opinions of the several plants and certain conclusions therefrom have been embodied in a report which has recently been issued, and which we abstract below.

At Atlanta they found three Imhoff tanks and sprinkling filter plants working well and creating no nuisance. C. C. Hommon, the chemist in charge, lives but a few yards from the largest of the three plants, the grounds around which are being beautified. (In each of the plants to be referred to mention of screens, sludge beds, etc., is omitted for brevity, only the principal features of the plant being named.)

At Baltimore they found Imhoff, hydrolytic and sludge digesting tanks, and sprinkling filters. The twenty-eight Imhoff tanks, which are circular with radial flow, were



Courtesy, Barber Asphalt Paving Co.  
OLD MACADAM RESURFACED WITH TWO-INCH MIXED ASPHALT TOP.  
Photographed in 1916, after three years of use.

not working well—in fact, some were not operating at all. The sprinkling filters were giving fine results, and creating no nuisance. Sludge from the various tanks was being delivered by the city with a 60 per cent moisture content at a drying house erected at the plant by a private company; which company reduces the moisture to 10 per cent and pays the city for the amount delivered at the rate of 81 cents per ton of sludge containing 10 per cent moisture.

In Philadelphia only a small part of the sewage is being treated, the plant being known as the Pennypack creek plant and consisting of Imhoff tanks and sprinkling filters. (This plant was described in Municipal Journal some months ago. In fact, all but two or three of the plants referred to in this report have been described by us within the past two or three years.) The results at this plant were considered to be "highly satisfactory."

At Fitchburg the rectangular Imhoff tanks and sprinkling filters were being "successfully operated." At Brocton the sewage passes through screens and sprinkling filters. No comment was made in the report on the



operation of these; but it was said that highly satisfactory results were being obtained by Robert Spurr Weston from an experimental activated sludge tank at the plant. Worcester was finding the sand filtering of tank effluent to be too expensive and was experimenting with Imhoff tanks and sprinkling filters, and was expecting to experiment with activated sludge also.

At Rochester was seen the Brighton plant already in operation; also the much larger plant, which is not yet completed, consisting of Riensch-Wurl screens, Imhoff tanks and sludge beds. The Brighton plant consists of a screen, Imhoff tanks, sprinkling filters, secondary tanks and sludge beds. At this plant, as at Baltimore, the unnecessary head of sewage is utilized to create power; the screened sewage at Brighton being passed through Pelton wheels under a 69-foot head, each wheel being belted to a 10 kw., d. c. generator, the resulting power being used to light the plant and run the cranes. No comment is made on the operation, but the interesting statement is made that the infiltration into the sewer runs as high as three hundred gallons per capita per day, or three times the house sewage provided for.

At Batavia are Imhoff tanks and sprinkling filters, the plant treating an average of two million gallons a day. The results were highly satisfactory, although the filter bed was being overloaded, being dosed at the rate of eight million gallons per acre. The superintendent's home is forty feet from the sludge beds and the family has never been bothered with odors from the plant.

The only plant at Cleveland is an activated sludge testing plant, designed to handle 750,000 gallons of sewage a day. At Canton the plant consists of Imhoff tanks and contact beds, the latter using crushed slag and washed gravel for the filtering material. One of the two units of the sludge beds is covered with a glass house to facilitate drying during rainy weather. At Columbus the treatment plant consisted of septic tanks and sprinkling filters designed in 1908 for a dry weather flow of twenty million gallons. The flow now exceeds this, and the septic tanks were being changed into Imhoff tanks. (This change has now been completed and the plant is being operated, we believe as an Imhoff plant.) At Mt. Vernon the sewage is passed through coarse bar screens and Imhoff tanks and the effluent turned into a creek without further treatment. The works are within about one mile of the business center and one of the principal streets passes within one-quarter of a mile of the plant. At Mason City the plant consisted of Imhoff tanks and sprinkling filters designed for one million gallons a day. Both the tanks and the filter bed are roofed with steel roof.

At Chicago the plants inspected were experimental activated sludge plants, one operated by the sanitary district and one by Armour & Company. Both were producing very satisfactory results. The activated sludge experimental plant at Milwaukee also was inspected.

Their conclusions from this inspection were that Imhoff tanks followed by filtration, with sludge beds, and, in some cases, secondary tanks, if properly designed and erected, gave the best results of any process that is in use today, with the exception of activated sludge. In all cases the former type of plants, when properly designed and operated, were giving satisfactory results.

The excellent results obtained by the activated sludge experimental plants led them to believe that this method will eventually supersede all others where a high degree of purification is necessary. Concerning this method, the principal question in their minds seemed to be as to the disposal of the sludge; but in the dry, warm climate of southern California it would be, they felt sure, possible to dry the sludge in beds without obnoxious odors.

At no Imhoff plant visited by them were odors to be

detected at a distance greater than two hundred feet from the plant, and in most cases the distance was less than two hundred feet. Apparently they considered that the best results were being obtained from the Pennypack (Philadelphia), Fitchburg and Batavia plants. The Fitchburg, Batavia and Mt. Vernon plants were most conspicuous by a close proximity to habitations. At Fitchburg good residences were at a distance of about seven hundred and fifty feet from the plant, at Batavia, about three hundred and eighty feet, and at Mount Vernon, about five hundred feet, while a population of about five hundred was living in good homes within one-quarter of a mile of the last named plant. Mason City is constructing its plant within one-quarter of a mile of good residences.

"Comparing the activated sludge process with the Imhoff tanks and sprinkling filter process, we find that the former occupies less space, costs less for construction, gives a better effluent and is absolutely odorless. The cost of operation, however, is greater than with the latter process, but its sludge has a high fertilizing value and the revenue derived from its sale will reduce the difference in cost of operation."

## TEST FOR CHLORINE IN WATER

Control of Disinfection Process by Ortho-Tolidin Test, With Colored Glass Plates as Color Standards—How to Prepare Plates.

By FRANCIS E. DANIELS.\*

For an intelligent control of the process of disinfection of water supplies it is highly essential to make frequent use of some quick chemical test in order to be sure that the disinfecting agent is being applied in the proper amounts at all times. By means of such a test the writer has frequently detected improper dosing in a few minutes. Low doses due to breaks, stoppages in feed control apparatus, improper mixing of chemicals, or weak hypochlorite have been shown by such tests, as also overdosing. On more than one occasion it has been observed that no hypochlorite had been put in the solution tank—only water being fed through the dosing apparatus.

Such a test therefore is very useful for the inspector; but it is more useful to the man in charge in that it gives him a ready means of satisfying himself that the dose is exactly what he has been instructed to make it. It also gives information days in advance of the completion of bacterial tests.

The disinfection by chlorine or its compounds at a good many water plants has been controlled by the so-called starch-iodide or Sims-Woodhead test. This is quite satisfactory in many places, but it is not so delicate and is more cumbersome for the inspector than another test known as the ortho-tolidin test.

The ortho-tolidin test was discovered and used by Prof. Phelps and the writer in 1907; but it was later improved by Messrs. Ellms and Hauser. It is to appear again in the new edition of the Standard Methods of Water Analysis of the American Public Health Association.

The test is extremely simple and can be performed by any one. A one-tenth per cent solution in ten per cent hydrochloric acid is used. In other words, one gram of ortho-tolidin is dissolved in one litre of ten per cent hydrochloric acid.

A test tube, or better still a 50 cc. Nessler tube, is filled to the mark with the water to be tested and 8 or 10 drops of the ortho-tolidin solution added and mixed by inverting two or three times. If chlorine be present the

\*Author of Operation of Sewage Disposal Plants.

yellow color soon appears, the intensity of which depending upon the amount of chlorine.

The test is about thirty times as delicate as the starch-iodide, or it will show chlorine to the extent of about one part in three hundred million parts of water.

Now in order to record the degree of color and hence the amount of chlorine present, it becomes necessary to compare it with known standards. These may be made with permanent solutions of potassium bichromate and copper sulphate in similar Nessler tubes as described in the Journal of American Public Health Association for February, 1916.

This is very satisfactory for laboratories; but it is too cumbersome for field work. So instead of carrying around a set of filled Nessler tubes the writer has devised a very satisfactory set of colored glass plates, tinted to match closely the corresponding permanent standard tubes, reading the chlorine from .02 to 1.0 part per million.

The plates are one inch square and a set of ten occupies a space of one and one-half cubic inches. They are made by taking an ordinary photographic plate and clearing it in sodium hyposulphite (the photographic "hypo"). When dry it is cut in one inch squares and tinted on the film side with lantern slide colors. Each square is made to match exactly a corresponding color tube and marked. A mat is made by cutting a three-quarter inch circle out of a piece of dark paper. This is put on the film side of the tinted square, over which is placed another inch square cut from a lantern slide cover and the whole bound round the edges with a strip of gummed paper. The finished plate has much the appearance of a miniature lantern slide.

It has been found that these plates are quite satisfactory for field work, it being only necessary to carry an empty Nessler tube, some testing solution in a small dropping bottle and the little plates. The comparison is easily made by holding the plate beside the tube and looking down through both in a good light. The plate which matches the color in the tube shows the chlorine figure. Of course this may not be the same as the applied dose, because between the time of application and the time of testing some of the chlorine may be used up by the organic matter in the water; but notwithstanding, the test is a valuable check on the operation.

In making the color plates it was found that color No. 1 (brilliant yellow) of the Peerless Japanese Transparent water colors matched exactly the standard colors, it being only necessary to use the water color in different degrees of dilution. The color is easily applied to the film by flooding it on with a soft brush. If the color is too deep it is easily toned down by holding the plate under the faucet for an instant. The coloring must be done in bright daylight and care must be used to get the plates to match the tubes exactly. The "self-blending colors" are prepared by the Japanese Water Color Company of New York. The color is dried on a sheet of paper and costs 10 cents per sheet. They are used for coloring lantern slides and photographs and are on sale in department stores or photographic supply shops.

The writer is not certain that the colors will not fade if exposed to the light for a long time, hence would recommend that the plates be kept in a box when not in use. Cleared photographic films might be used but the writer prefers glass plates.

There has recently been proposed another test for chlorine with about the same sensitiveness as ortho-tolidin, but the writer has not been able to procure any of the material under its chemical name nor has he been

able to learn its commercial designation. It is said to give a purplish color with chlorine and not to be seriously affected by nitrites as is ortho-tolidin. It is technically known as hexamethyltri-p-animotriphenylmethane and appears to be somewhat related to the leuco base of crystal violet. Any information on this compound from any of the readers of this Journal will be appreciated by the writer.

While the new test may be better in some cases, ortho-tolidin has been found very satisfactory as nitrites and similar substances are usually not present in drinking waters in sufficient quantity to have serious effect. For sewages or filter effluents the case may be different.

#### REFUSE IN STREET GRADING.

Wilmington, North Carolina, has recently been using incombustible refuse for grading its streets, including in this tin cans, many of which have been sorted out at the incinerator. Last month, rubbish consisting largely of such tin cans was spread on eight blocks of the city, and a heavy steam roller run over them several times. After the cans had thus been flattened out, a coating of ashes was placed over them and the roller used to compact these.

A great many cities use ashes for grading their streets, and these are often accompanied by greater or less quantities of tin cans; but in most cases, we believe, the practice is to remove the cans and dispose of them otherwise. The idea of flattening them by using the steam roller is a suggestion that may be worthy a trial in other cities. Incidentally, with the present high price of metals, it would also seem to us to be worth considering whether the cans could not be sold at a profit, either for detinning or melting down for sash weights.

#### TOLEDO'S NEW HIGH PRESSURE SYSTEM.

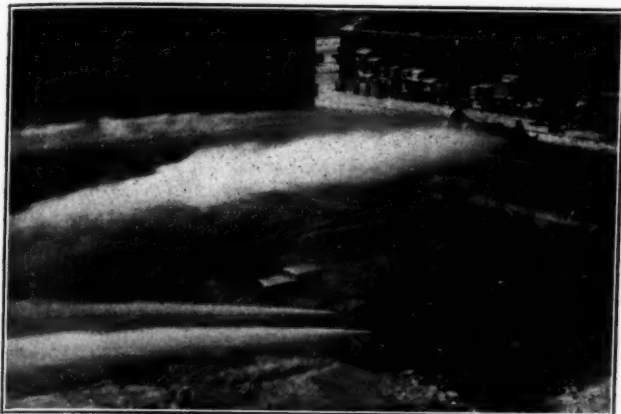
Toledo, Ohio, about the middle of January tested its new high-pressure pumping plant, which is now ready for service. The high pressure mains were placed in the ground about six years ago, but inability to decide upon the location of the pumping station delayed use of them until this year. As 61 new high-pressure fire hydrants, however, had been set connected with these mains, the old water supply system was connected to the mains at two points, chiefly in order to utilize these additional hydrants pending the completion of the high pressure pumping plant; with the idea, however, that on the completion of the high-pressure system, the two systems of mains would be separated.

The construction of the pumping station was begun in 1913. The building is two and a half stories high above ground level and is located along the river, with its second floor level with the floor of a bridge that crosses the river at this point. Two intake wells extend below river level and in these are intake pipes connected to the suction ends of four multi-stage centrifugal pumps, each driven by a 440 kw. electric motor. Two independent cables supply current to the plant. For a short distance from the pumping station the mains are twelve inches in diameter and throughout the rest of the high pressure area are ten inches. Each pump has a capacity of 2,000 gallons a minute, and has been tested to a pressure of 600 pounds to the square inch. It is proposed to start the pressure at 125 pounds when an alarm is sounded from any box within the high pressure district, which pressure will be increased if directed



by the fire chief. The mains throughout the district will be kept full at all times, but not at a pressure anywhere near the 125 pounds. The average pressure on the domestic water supply is eighty pounds per square inch.

There are 31 fire alarm boxes in the high pressure district and 61 high pressure fire hydrants. A chart of the district in the station shows the pump operator where each fire box and each hydrant is located. Every alarm from any of the high service alarm boxes is repeated on a gong in the main pump room. When this alarm sounds the operator starts one of the pumps, bringing the pressure up to 125 pounds in a few seconds.



Courtesy of Toledo Blade.

#### TURRETS AND DELUGE STREAMS IN ACTION.

The plant is equipped with a motor generator and direct control switches by which it may make its own current for lighting and for emergency service.

A force of eight men will be employed to operate the pumping station, working in three 8-hour shifts; these consisting of C. H. Carroll as chief, three operators and

four assistants. The upper floor of the station will house the waterworks and finance departments, and the division of harbors and bridges will be provided with official quarters on the ground floor.

As the nozzle force of streams connected to the high service system would be sufficient to endanger the lives of firemen if attempting to hold the hose, fire chief Elling has recommended the purchase of eight "iron men" or heavy metal supports to be anchored to the hose wagons for holding the nozzles. With the use of the high pressure system, it is proposed to remove all fire steamers from the downtown district and assign them to outside stations.

The high service mains cost \$120,000 and the pumping station and site cost \$200,000.

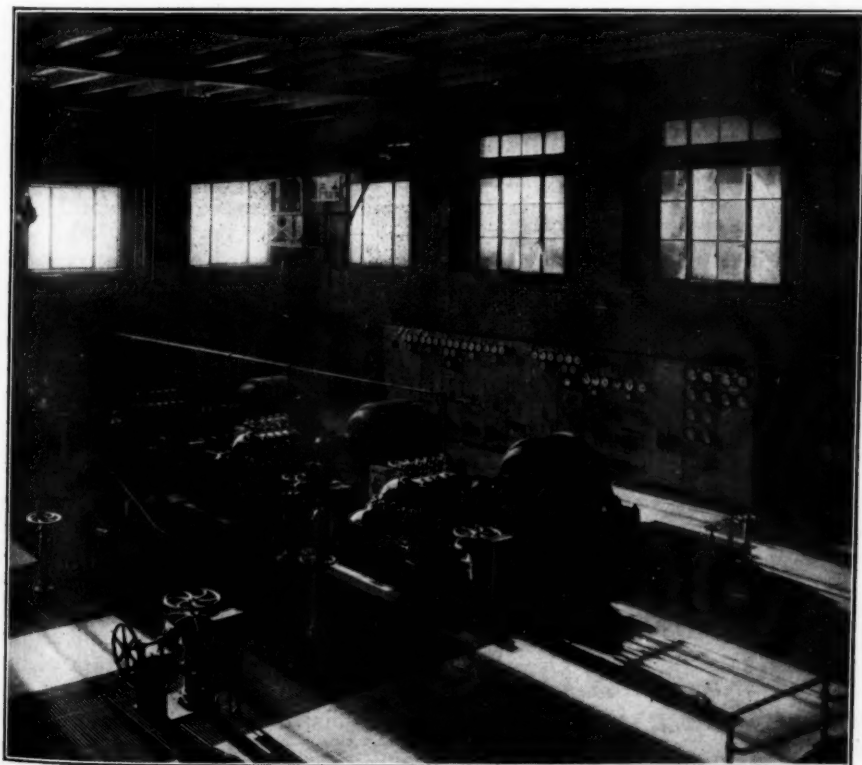
#### SUPPORTING TROLLEY WIRES FROM BUILDINGS.

In our issue of January 18th, we gave an abstract of a paper by Mr. Doane, one of the suggestions of which was that trolley wires be supported by cross-wires or suspension cables anchored in buildings on the opposite sides of the street, rather than supported by poles, thus eliminating the objectionable poles from the sidewalk. In reply to questions relative to this, Mr. Doane has sent us some further information on this point.

He states that such cross-wires should be attached to buildings at those places where a partition wall joins the outer wall, or at the corner of a building, and not between partition walls; since the tension on the cross wires is considerable and might be more than could be received by the face walls without dislocation or destruction of them. If, however, a wall-plate is fastened to the wall by bolts embedded in a wall running practically at right angles to the street, this construction would furnish ample resistance to the tension. He states that

in the territory covered by his investigations, central and western Europe and Italy, wooden houses in the cities are practically non-existent. He believes that it is the universal practice for the company or city owning these cross-wires to hold themselves responsible for any damage done to the building. The agreement made by one of the largest electrical construction companies provides that the company will repair the wall after the work is done, pointing it up, painting, etc., so that its original state is restored, and that it further agrees to remove the wire if the house owner should desire it, in which case the surface of the wall is restored to its original condition. The cost to the company of a wall plate and the pointing, painting, etc., of the surface around the plate so as to bring it to its original condition, is less than that of installing a pole for this purpose. Very few house owners have objected to the attachment of the wall plates and wires to their houses, generally preferring this to having a pole in front of their house.

As to the complaints of owners on account of the passing of linemen through the house in order to reach



Courtesy of Toledo Blade.

#### THREE OF THE FOUR PUMPS AND MOTORS, AND SWITCHBOARDS.

wires attached to roofs, Mr. Doane states that this is required only in the case of high buildings such as office buildings or apartment houses, in which case they would pass only through the staircase on their way to the attic, and thus would not be likely to disturb anyone. In residence houses, where the roofs are lower, they would probably use a ladder on the outside of the house for reaching the wire support.

## GENERAL PAVING PRINCIPLES

### Grade and Width—Thickness of Surfacing—Drainage—Foundations—Sub-Grade—Joints—Shoulders and Gutters—Report of Committee of A. S. C. E.

At the January meeting of the American Society of Civil Engineers, the "Committee on Materials for Road Construction and on Standards for Their Test and Use" presented a progress report, which consisted chiefly of a statement of the fundamental principles on which specifications covering each of the several types of roads and pavements should be based. As a preliminary to the discussion of the several types, it presented certain general principles which, although more or less elementary and fundamental, are often found to be neglected by those engaged in roadway work. These we have somewhat condensed in the following:

**Lines and Grades.**—Choice of the material, or methods of using a particular material, may be affected by the grades as fixed. Certain materials, or results of using materials, for highway surfacings will be unsatisfactory outside of certain limits of grades. Conservative practice has fixed the maximum limits for satisfactory results with grades, as follows:

Kind of Roadway.	Maximum Grade. Per Cent.
Gravel .....	12.0
Broken stone .....	12.0
Bituminous surface .....	6.0
Bituminous macadam .....	8.0
Bituminous concrete .....	8.0
Sheet-asphalt .....	5.0
Cement-concrete .....	8.0
Brick (cement grout filler).....	6.0
Brick (bituminous filler).....	12.0
Stone block (cement grout filler).....	9.0
Stone block (bituminous filler).....	15.0
Wood block .....	4.0

**Width.**—Where motor traffic forms a considerable proportion of the total traffic likely to use a highway, the unit width of traffic lines to be considered is 9 or 10 ft. instead of 7 or 8 ft. as heretofore, because of the greater clearance required for the safe passing of the units of such traffic.

Where bituminous pavements are laid, the edges need protection and a sudden transition from the pavement to any softer shoulder material should be avoided by means of extra width, or of cement-concrete or other edges, and such reinforcement of the shoulder material as may be necessary.

The width of roadways of rigid material, such as cement-concrete or vitrified block, should be at least equal to what would be prescribed under local conditions for a less rigid surfacing. The great difference between the firmness of a rigid roadway surfacing and of material frequently available for the shoulders thereto, often makes it necessary, for safety and convenience of traffic, as well as for economy of maintenance, that the rigid surfacing should be built wider than would answer for a more flexible surfacing, such as water-bound macadam, for instance, under the same local conditions.

Too narrow a width of roadway encourages, if it does not compel, concentration of traffic to such an extent as

to make frequently unfair demands on what would otherwise be a suitable and efficient material for the surfacing. This may be especially noticeable at abrupt changes in the lines of the highway, where any tendency toward the improper concentration of traffic into too narrow areas should be avoided, as far as possible, by such adjustment or separation of lines, and adjustment of width, of crown, or of slope of the roadway surfacing, as will keep the strains of the surfacing material within reasonable limits for it.

**Thickness.**—The thickness of the pavement or surfacing, of course, will be dependent largely on its type, but it will also be affected by the presence or absence in the construction of an artificial foundation, and, in fact, on the character and ability of the base on which the surfacing is to rest. Approved practice establishes the limits given in Table 1 for the extremes of thickness for the various layers of the pavement or road crust.

TABLE 1.

Kind of roadway.	Thickness of artificial foundation,* in inches.	Thickness of sand cushion or binder course, in inches.	Thickness of wearing course, in inches.
Gravel .....	4 to 8	.....	2 to 4
Broken stone.....	3 to 8	.....	2 to 3
Bituminous surface...	4 to 8	.....	1½ to 2
Bituminous macadam.	3 to 8	.....	2 to 3
Bituminous concrete...	3 to 8	.....	1½ to 3
Sheet-asphalt .....	5 to 8	1 to 1½	1½ to 2
Cement concrete (one-course) .....	.....	.....	5 to 8
Cement concrete (two-course) .....	4 to 8	.....	2
Brick .....	4 to 8	¾ to 1½	3 to 4
Stone block.....	5 to 12	1 to 2	2½ to 5
Wood block.....	5 to 8	½	3½ to 4

\*Not including extraordinary provisions such as V-drains or sub-base courses.

Although the general practice has been too often perhaps to use mass, for the sake of safety, in the preparation of the pavement, it now appears to be evident that some waste has been incurred in the past in this direction, and that a more scientific determination of the thickness, as well as of many other features of highway work, is possible, without sacrifice of safety and yet with economy. However, in view of the recent, constant, and rapid increase of the weight of, and consequently of the strains caused by, the traffic, it will be in the interests of economy for designs of highways to be made with proper consideration of further increases.

**Drainage.**—The use of any form of pavement or road crust, whether bituminous or non-bituminous, does not relieve the necessity of proper drainage in every case. It is not only necessary to provide for such under-drainage as will place and keep the sub-grade in a condition satisfactorily free from moisture and in a state of suitable efficiency, but it is also necessary to provide and to preserve economically such provisions for surface drainage as will, with the provisions of under-drainage, insure these results fairly permanently. Storm-water coming to the roadway must be carried quickly and rapidly away from it by automatic arrangements to the natural water-courses, where it can be disposed of finally. The arrangements referred to and so made, such as inlets, ditches, gutters, and culverts, should be designed and placed so as to give the least possible offense to the users of the roadway and the abutters, and yet be built so as to preserve their integrity and efficiency with the least need for attention and expense under even the most persistently adverse natural conditions. A proper longitudinal grade for ditches and gutters is particularly important, in order that the ill and wide effects of standing water may be avoided.



A proper cross-section for ditches is also important, in order that the waterway may not become obstructed by the sliding in of the sides.

As related to drainage, the matter of the crown of the roadway is particularly important. The ideal roadway surface would be flat in cross-section were it not for the necessity of the automatic removal of surface water to the channels where it must be most conveniently carried along. Crowning the roadway tends to concentrate the traffic on the ridge where it is then most comfortable for the travelers, and the amount of crown which will result in this concentration on the ridge varies with the type of pavements. Also, the rate of crown necessary for the proper removal of storm-water to the gutters or ditches varies with the type, and with the provisions to be made for the cleaning and the upkeep of the roadway surface. In the general practice, the amount of crown for the shoulders of an uncurbed roadway has usually been a cross-slope of one inch per foot, the shoulders being of the natural earthy material, and this rate is to be recommended for shoulders, except in special cases.

The crown generally used in the construction of broken stone roadways is excessive when bituminous materials are used, and a crown of even one-half inch per foot should be avoided when a lesser crown can be secured without detriment to the surface drainage.

For the various roadway surfacings, the practice generally observed and to be recommended is as given in Table 2.

TABLE 2.

Kind of roadway.	Crown Recommended:	
	Maximum. 1 in. to the ft.	Minimum. ½ in. to the ft.
Gravel .....	¾ " " " "	½ " " " "
Broken stone .....	¾ " " " "	½ " " " "
Bituminous surface .....	½ " " " "	¼ " " " "
Bituminous macadam.....	½ " " " "	¼ " " " "
Bituminous concrete.....	½ " " " "	¼ " " " "
Sheet-asphalt .....	¼ " " " "	⅛ " " " "
Cement-concrete .....	¾ " " " "	¼ " " " "
Brick .....	¾ " " " "	⅛ " " " "
Stone block.....	½ " " " "	¼ " " " "
Wood block.....	¾ " " " "	⅛ " " " "

Concave pavements of cement-concrete, vitrified block, or stone block may frequently be found advantageous for alleys, and, in such cases, the same rates of slopes in cross-section as those previously given should govern.

**Artificial Foundations.**—Where the character of the traffic justifies the use of an artificial surfacing, it also demands a correspondingly strong foundation. Whether or not an artificial foundation shall be supplied will depend on the local conditions, but in the selection of the materials and the methods of construction of the artificial foundation, every consideration should first be given to the possibilities for securing the greatest efficiency from the natural foundation. Economy in reference to the roadway will be had from the proper choice of the various materials available for artificial foundations, such as sand, gravel, broken stone, and concrete.

In the construction of a concrete foundation, the sub-grade should first be properly prepared and its greatest efficiency developed. The thickness of the cement-concrete artificial foundation usually laid is 5 or 6 inches, but it may be varied advantageously according to the local conditions between 4 and 12 inches. The thickness may be varied sometimes between the center of the roadway and the sides.

The most usual proportions for a cement-concrete foundation have been one part cement, three parts fine aggregate, and six parts coarse aggregate. This standard, however, is empirical rather than scientific, and a more rational proportion in any case should be developed according to the needs and facilities of each case. It may

often be desirable to increase the mass in some cases at the expense of unit strength, or to increase the mass for the sake of economy in the more expensive material.

**Sub-Grade.**—The use of any form of pavement or road crust does not relieve the necessity for the construction of a well-drained, thoroughly compacted, homogeneous, and stable sub-grade in every case. Indeed, such improvement of the highway generally attracts heavier traffic and thus increases the stresses on the sub-grade. Even when an artificial foundation is to be constructed on the sub-grade, proper attention should be given to the preparation of the latter, in order that the greatest economy may be had in the design and expense for the artificial foundation, and, generally speaking at least, the higher the type and the more expensive the artificial foundation, the greater care should be exercised to develop to the utmost the possibilities of the sub-grade. Uniformity in its composition and compaction, as well as evenness of its surface, is far more important than has apparently been generally considered necessary up to this time, and permanence of all the desirable qualities in the sub-grade is equally important.

**Joints.**—For the ordinary joints in block pavements, the materials and methods of filling should be selected so as to produce not only a surface which will retain to the utmost its imperviousness and the stability of the blocks themselves in place, but also as far as practicable they should conduce toward evenness of wear of the surface of the pavement. If the blocks are resistant to abrasion, but perhaps inclined to round off at the edges of the upper surface under traffic, such filling of the joints is desirable as will lend additional resistance in the blocks to this rounding off at the joints.

A bituminous filler may be preferred to a cement-grout filler, on account of the lower cost of street-opening repairs, the better foothold provided for horses, and the securing of a more resilient and hence less noisy pavement. On steep grades, where some roughness of surface may be desirable for the sake of affording better foothold for animals, some openness at the top of the joint is desirable, and the bituminous joint fillers may be preferred. With bituminous joint fillers, care must be taken to select materials which will not be too brittle in cold weather and so chip out from joints under traffic, and which will not be so soft in hot weather as to flow out of the joints between the blocks. It is believed, although not yet generally admitted as having been actually proven by experience, that the use of a bituminous mastic for joint filling would be an improvement over the customary practice of using bituminous material alone for this purpose. Great care should be taken with bituminous fillers of any kind to insure the actual filling of the joints between the blocks, and great care must be taken to insure this result.

**Shoulders and Gutters.**—Where rigid or fairly rigid pavements are laid, their edges should be protected and the sudden transition from such a pavement to any softer shoulder material avoided by means of edges or such reinforcement of the shoulder material as may be necessary. The line or strip of contact between a cement-concrete roadway and the flanking material of the shoulders being the zone of weakness under traffic, it is important to accommodate the traffic and to protect the roadway as well as the shoulders from the formation of ruts along this line. This is especially true when the roadway is so narrow as to result in the frequent passage of vehicles from the pavement to the shoulders.

Such material for and construction of the shoulders should be had as will result in their being capable of efficient and economical maintenance under the local conditions existing or likely to prevail.

The shoulders may be reinforced with paving, concrete, macadam, gravel, or similar surfacings; or they may be of the natural local material available, due consideration being given to the advisability of tapering down from a relatively high rigidity of the roadway itself to any soft natural material at the outside edges of the road.

**Finishing of Surface.** An objectionable slipperiness of many pavements may be decreased or prevented by proper precautions during construction or by proper treatment thereafter. The length of time that a finished pavement should be closed to traffic in order to season properly before use varies from a few hours to several days, dependent on the character of the material and methods used and on climatic and other local conditions. Pavements in which Portland cement is used for filling the joints or in the mass of the surfacing itself should seldom, if ever, be closed for less than two weeks after completion.

The committee consists of W. W. Crosby, chairman; H. K. Bishop, A. H. Blanchard, secretary; A. W. Dean, N. P. Lewis, C. J. Tilden and G. W. Tillson.

## WOOD BLOCK SPECIFICATIONS

### Adoption by American Wood Preservers' Association of Those Adopted Last Fall by the A. S. M. I.— Omission of the Cushion.

The American Wood Preservers' Association, in its convention in New York in January, adopted specifications for wood block paving which were the same as those adopted by the American Society of Municipal Improvements last October except for a few minor changes. This was the result of a meeting held before the convention of the latter society by members of six associations interested in wood block paving—the two societies above mentioned, American Society for Testing Materials, American Society of Civil Engineers, American Railway Engineering Association and Southern Pine Association—which members agreed to present to their respective societies identical specifications on timber, size of blocks, treatment, handling after treatment and inspection. The matters of cushion, foundation, laying and filler were not considered at this conference.

The committee of the American Wood Preservers' Association disapproved of sand filler or sand cushion. Said the committee in its report:

Successful pavements are in existence where these forms of construction were used. However, there have been so many failures and cases of trouble directly caused either by sand filler or sand cushion that we feel the risk of using them is not offset by their lower cost.

Sand fillers are not waterproof and, hence, permit water to reach the base of the blocks. This often causes trouble from expansion. If the blocks dry out and shrink, the sand settles down in the spaces between the blocks, creating the possibility of further trouble if they later become wet and expand.

Sand cushion often causes trouble, especially where there is vibration, by shifting and creating an uneven surface.

It was not feasible for the committee to prepare a specification for crown that would fit all conditions. The following may be used satisfactorily for streets paved with wood block on which there are no street-car tracks, and which are between 20 ft. and 50 ft. in width: Height of crown in feet shall be 0.013 of the paved width in feet. This formula gives too much crown for streets wider than 50 ft., or those on which there are street-car tracks. It does not give enough crown on streets less than 20 ft. wide.

It is the opinion of the committee that if these specifications are carefully followed the resulting street will not bleed excessively, nor should there be serious expansion troubles. The method of forcing in the oil should give the maximum penetration obtainable with the absorption used. These specifications require from 25 to 50 per cent more time than is commonly required for creosoted blocks, but we feel that the possibility of increasing durability and lessening expansion and bleeding troubles warrants this

course. City engineers and others who have occasion to use these specifications should bear in mind this item of time, and be sure that it is spent upon treatment. From 10 to 12 hours are required to properly treat southern pine blocks by these specifications.

Your committee has been impressed with the sentiment gradually crystallizing among engineers and manufacturers in favor of an absolutely rigid and water-tight type of pavement construction. Much favorable attention has been directed to a practice which is, unfortunately, not so common in this country as abroad; namely, that of laying the blocks on a smoothly finished concrete base, and particularly to that form wherein the blocks were either dipped in pitch immediately before laying, or where set in hot pitch swabbed upon the concrete base. Recent examination of some old pavements so constructed has furnished the most convincing argument in favor of such a type. It seems that where this type of construction has been abandoned it has been done solely on account of the fact that it was thought possible to reduce the cost of construction without detrimental effect. In fact, the increased cost seems to be the chief obstacle to its more general adoption.

Within the last two years a new method has been introduced which your committee believes to be of great importance to the future of this industry. It consists simply in coating the smoothly finished concrete base with bituminous cement, and allowing this to get cold and harden before attempting to set the blocks on it. The expedient of allowing the cement first to cool and harden before setting the blocks substantially removes the objection of high cost, and it also removes the objection in regard to difficulty of replacing faulty blocks where set in hot pitch. Furthermore, it accomplishes the same results as if the blocks had actually been set while the pitch was still hot, as it will be found that after a day or so the blocks all adhere firmly to the base.

A series of comparative tests are now in progress to determine safe loads on typical pavement sections made with and without cushion. While incomplete, these tests appear largely to favor the rigid type of construction. They also seem to indicate the feasibility of using a shallower wood block in connection with a smooth base without in any way sacrificing strength.

Some of the members objected to the steaming required by the specifications, claiming that it involves unnecessary expense and weakens the blocks (see *Municipal Journal* for December 7th, 1916). But the committee maintained that steaming prevents bleeding and reduces expansion, and does no harm if the temperature is kept below 240 degrees Fahr.

## HEALTH INSURANCE.

The subject of Health Insurance has been receiving attention in this country recently. This involves medical attention and care during illness, but even more the prevention of sickness by regular medical examinations and improved conditions surrounding workmen. Since the expenses of health insurance are paid by contributions from the employer, the employee and the state, each of these three is financially interested in the health of every worker. It is obviously to the advantage of all concerned to secure healthful conditions in factories and other working places, for it is less expensive to maintain good health than to recover it. Also the periodic medical examinations afford an opportunity to combat a disease in its earlier stages. The working of the system in England and Germany has resulted in better health and less illness.

Some cities give pensions to their employees in certain departments. It is to the advantage of such cities to secure as long service (up to the age of retirement) as possible from each employee, and therefore to keep them in good health and assist them in warding off disease and debility. The Street Cleaning Department of New York City requires its employees to receive free medical examinations regularly by department physicians in order to preserve their health, and furnishes free attention in case of sickness, and finds that it pays from a purely mercenary standpoint.



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## "GETTING EVEN" WITH THE WATER DEPARTMENT.

Brooklyn, N. Y., has been threatened with a water famine recently, to the extent of having to draw on the Manhattan supply and purchase more than usual from private companies, of which several still operate in what were separate villages before consolidation into a Greater New York. While confronted with this condition the water commissioner received the following letter:

Department of Water Supply:

Gentlemen—Two years ago you fined me a penalty of 15 per cent for being in arrears for one year in payment for water tax. I went home and turned on two faucets full tilt and they have been running night and day since then. It does not pay to rob the property owners. Brooklyn is a tax cursed city. How nice you let the property owner stand in your office and wait till all the clerks have done talking baseball and their cigarettes go out.

A VICTIM.

As a matter of fact, water works men know that not only were the taxpayers the "victims" in this case, but that where such things are possible they are the victims of their own folly or stupidity in opposing the use of meters. Much waste can, it is true, be prevented temporarily by inspecting all house plumbing and requiring leaks in it to be stopped. But such inspections are seldom made oftener than once a year, and new leaks in abundance may begin in the mean time. Moreover, consumers who, like the "victim" quoted above, feel revengeful at having to spend money for repairing minor leaks can easily run to waste many times the amount lost through such leaks. The only sure and fair way is to make each consumer pay for what enters his house, no more (under the flat rate system the careful consumers pay for part of what the others waste) and no less.

## THE PROFITS OF MUNICIPAL UTILITIES.

Compared to the problems of municipal utility finances, those of private companies are simple business. The latter have only to consider the questions of a reasonable return, for adequate service, on a fair valuation; in the case of city-owned plants there is the additional problem of what to do with the profits. Some believe that under proper municipal ownership there would be no profit—a sort of glorious nothing symbolizing the emancipation of the consumer from the exploitation of the ruthless corporation. If the science of rate-making could attain the state of prophecy, municipal plants would give the consumer the best service at the minimum rate and end up the year, after paying running expenses, debt charges, depreciation and development costs, with this self-satisfied zero. But rate-making is not yet such a scheme—and the adoption by municipal plants of business development by modern advertising methods makes perfect financing still more uncertain. All indications are, therefore, that, with the development of cities, profit-making utilities, already widely prevalent, will become the normal of city operations.

But these profits seem to be very embarrassing. In an eastern city recently the board of water supply refused, in undignified altercations with the other city officials, to turn the profits of the waterworks into the general fund to relieve what was said to be very urgent financial stringency. A city in the mid-west, suffering from the difficulties of a low tax-limit imposed by the state, recently considered at length the raising of the water rates as a measure of relief, but decided not to. A recent opinion by an assistant attorney general of a western state prohibits the transferring of the profits made by one municipal plant to the general funds or to those of another utility. When the city finds itself in this unhappy dilemma of having done good business, it can not, like the private corporation whose profits are being regulated down to the six or seven per cent limit, lose some of the excess in the intricate mazes of "legal and development expenses." It is proper for a city to collect franchise and general taxes from a privately-owned utility, but not, it appears, to collect them from a utility that belongs to the city, even by the simple process of transfer of funds. Yet there seems to be no objection to the city making up from its general funds the deficits of a utility.

Of course, if the service needs improvement or extension, the proper use of profits is obvious. Also, the appearance of a profit, if no extensions are needed, should be followed by a reduction of rates, allowing an adequate margin of safety. But the problem is when the profit begins to appear, or persist, and when the plant is adequate.

The situation involves municipal ethics, the principles of which are as yet barely realized. It is obvious that the transfer of the profits of a light plant to the general fund means the excessive taxing of the consumers, who are not the whole citizen body (especially where there is private competition) for the benefit of the whole city. It means, for instance, that a man must pay for education and fire protection according to the number of kilowatt-hours he consumes—which is not exactly equitable. And yet it seems to be perfectly ethical to make a man pay for education, not in proportion to the number of his children, but according to the foot frontage of his real estate. And this being the basis of almost all municipal taxation in this country.

The probable reason for objection by state regulatory bodies to the transfer of profits is a fear of still further increasing the practice of juggling funds and the notorious muddle of municipal bookkeeping. Such utiliza-

tion of profits would also offer tempting opportunities for inefficient management or mal-administration of one plant to flourish on excessive rates of another. But if the accounts of the city and the utilities are kept according to approved standards, such as those set by the state of Washington, for instance, and there is a clear knowledge of just what is being done with the money, the first objection loses its force. And there appears to us to be no very powerful reason why the profits of one municipal plant should not be used to build up another during the doubtful and lean years of beginning.

Very disquieting conditions of municipal financing urge this reasoning further. The services of the cities are growing much more rapidly than their populations and tax abilities. The development of the city's sources of revenue is one of the most urgent of present municipal problems. It is more than possible that one of the solutions will be found in this very difficulty of profits of municipal utilities. New methods of production of service and increasing efficiency of operation, and the growth of demand, have tended, during the whole development of the utilities, to lower cost of production and lower rates—even when all other necessities have increased in price. This tendency will probably continue. It seems to be easier to collect water and light bills than to ask for a higher tax rate. Why not maintain rates as the cost of production decreases and conserve the increasing profits to help carry the city's growing financial burdens?

#### HIGHWAY BRIDGES.\*

Previous to 1890 wrought iron was generally employed for trusses, girders and floor beams of highway bridges and untreated wood for the stringers and floor surface, the wooden stringers being spaced about 2 feet apart and covered with 3-inch or 4-inch floor plank, a second layer sometimes being added for a wearing surface. The standard width was 16 feet, although bridges 14 feet and even 12 feet in width were common.

In the early nineties medium steel replaced wrought iron and the allowable stresses were increased about 25 per cent in tension and 20 per cent in compression. This allowed a material decrease in weight. The general use of wooden floors was continued until about 1900, when steel floor stringers were brought into use, and in some of the larger cities the untreated wooden wearing surfaces were replaced by a brick pavement on a creosoted plank floor. Shortly after this reinforced concrete floor slabs, covered with a layer of gravel for a wearing surface, were used. On account of their weight these could not be used on the old bridges.

At present time the use of steel stringers and reinforced concrete floor slabs covered with gravel for a wearing surface has become the general practice in country steel highway bridges, while for more important steel structures in the larger cities, creosoted wood block is in general use. Gravel is not altogether satisfactory and will probably be displaced in the near future.

About ten years ago reinforced concrete bridges came into more or less general use, and are now favored to a large extent on account of their durability, low cost of maintenance and the possibilities for artistic treatment.

There has also been a great increase in bridge capacity. Formerly a country highway bridge in Minnesota was designed for a uniform live load of 80 pounds per square foot, and a concentrated live load of 5 tons on two pairs of wheels 8 feet on centers. Now the floors of such bridges are required by law to be designed for a uniform live load of 100 pounds per square foot, and a concentrated load consisting of a 20-ton engine with 15 tons

on the rear axle. During the past year or two a minimum width of 18 feet of roadway has become the standard practice.

These changes in design have resulted in a great increase in weight, so that a steel bridge of ordinary span designed in accordance with present practice will weigh about 75 per cent more than a bridge of the same span designed according to the standards of fifteen years ago. This increase in weight and capacity has, of course, increased the cost, but the advantages of greater strength and permanence have been recognized by public officials.

The beauty of the concrete arch cannot be approached by any steel construction, and even with concrete girders the introduction of a few curves and the use of an artistic concrete railing will produce a structure which is much more pleasing in appearance than anything which can be designed in steel.

Wherever the height of the opening will permit and the character of the foundations is suitable the arch should be used. In some cases where the height of the opening is sufficient the character of the foundations makes the use of the arch inadvisable on account of the difficulty in taking care of the horizontal thrust at the abutments, and in such cases a girder bridge with the bottom edge of the girders curved to simulate an arch can be used often with good effect.

The use of concrete light posts will add greatly to the appearance of the structure. With concrete arches the addition of a moderate amount of dead load is not an important factor in the design or cost, and on all such structures it is advisable to have a permanent pavement on the roadway, using either brick or creosote block and concrete sidewalks.

#### PRIZES FOR ESSAYS ON MUNICIPAL TOPICS.

The National Municipal League offers a prize of one hundred dollars (called the William H. Baldwin Prize) for the best essay on the subject of "Tendencies in Municipal Budget Making," the author to be an "undergraduate student registered in a regular course in any college or university in the United States offering direct instruction in municipal government."

The writer may either describe the tendencies in some particular city, or may review the tendencies as reflected in recent literature; but should give consideration to the following topics:

Preparation and review of the estimates; form and content; relation between segregation and administration; conditions attached to appropriations; procedure and publicity. The essays must not contain more than 10,000 words, must be typewritten in duplicate and both copies sent not later than March 15th to Clinton Rogers Woodruff, Secretary of the League, North American Building, Philadelphia, and marked "For the William H. Baldwin Prize." The essay will be marked with a "nom-de-plume," and this and the full name, address, class and college be sent in a sealed envelope.

Another prize (known as the Morton Denison Hull Prize) of \$200 is offered by the League for an essay on any suitable subject connected with municipal government and approved by the Secretary of the League; the author to be a post-graduate student who is, or has been within a year preceding September 15th, 1917, registered and resident in any college or university of the United States offering distinct and independent instruction in municipal government. This essay must not exceed 20,000 words; must contain marginal or foot-note references to the authorities consulted; must be typewritten in duplicate, and sent to Secretary Woodruff not later than September 15, 1917, with nom-de-plume as described. Further information can be obtained from the Secretary.

\*From a paper by L. P. Wolff, before the Minnesota Surveyors' and Engineers' Society.



# The WEEK'S NEWS

State Highway Progress in Michigan, Wisconsin and Virginia—Smallpox in Connecticut and Arkansas—Health Board Control Over New York Restaurants—Waterworks Finances of Niagara Falls, Providence and Duluth—Big Fires in New York, Pittsburgh, Chicago, Hartford and Boston—Attack Legality of Dayton Charter—New Jersey Commission on Municipalities—Seattle's Mayor Again in Trouble—Traffic Congestion in Cleveland—New Dallas Jitney Ordinance—San Francisco's Municipal Railway—City Planning in Erie and Fresno.

## ROADS AND PAVEMENTS

### Auto Fees for Michigan Good Roads.

Lansing, Mich.—The sum of \$1,739,343.62 for good roads in Michigan resulted from sale of automobile licenses under the Newell Smith automobile tax law, passed by the legislature of 1915, according to secretary of state Coleman V. Vaughan. During November and December \$183,485.57 was collected for the 1917 tax. This makes a total to date for both the state highway and county funds of \$1,922,829. Of this total the amounts which go direct to the state highway department and the counties are as follows: Highway fund, \$931,741.61; counties, \$931,740.85. The apportionment of the collections for the last half of the year were: Highway department, \$223,486.12, including special fees of \$25,231.88; counties, \$198,253.84.

### \$87,000,000 Needed for Wisconsin Highways.

Madison, Wis.—"The total remaining cost of placing the highways and bridges of Wisconsin in reasonably fair condition for maintenance would be \$87,000,000," is a statement made in the report of the Wisconsin highway commission, just filed with the governor. The report says indications are that the cost of completing the prospective state highway system, if reduced to 15,000 miles, would be \$31,000,000; the cost of placing the 61,000 miles of township roads in suitable condition for maintenance would be \$24,000,000; the cost of reconstructing bridges would be \$32,000,000. Assuming that \$8,000,000 in federal aid is received from 1917 to 1926 inclusive, the gross cost to the people of Wisconsin for reconstructing its highways would be \$79,000,000. "If present expenditures are continued, under present methods and laws, \$80,000,000 will have been expended in the next eight years, and at the end of that period the 61,000 miles of town road will be little improved over their present condition," says the report. "In accordance with the above estimates the annual cost of maintaining Wisconsin's highways would be \$3,200,000 per year for the state highways; and \$440,000 for all bridges—a total annual cost of maintenance of \$6,060,000. The figures are founded on the experience of the state highway commission for five years and a complete knowledge of road and bridge conditions and needs in Wisconsin. They are given to indicate to the average man the magnitude of the road and bridge problem which faces the state. The above figures neglect the probable cost of new roads, many miles of which will be laid out in the next ten years." The commission then shows that if the total estimated cost to the people of the state of reconstructing the remainder of the state highways and of reconstructing the town roads (\$47,000,000) is divided by ten and of reconstructing all bridges (\$32,000,000) is divided by twenty, it would produce a net cost of \$6,340,000 per year, which is equal to a mill tax of 1.8 mills for ten years on the anticipated average state valuation for the ten years, \$3,500,000,000. If the total cost of maintenance is placed against the state valuation, it indicates an average of 1.73 mills for maintenance, or a total average tax for the construction and maintenance, of all roads and bridges during the ten-year period, of 3.53 mills on the state valuation. While the population has increased 121 per cent in the past forty years and the travel has increased all out of proportion to the increase in population, the methods of road maintenance and administration in the towns has not varied in twenty years. Wisconsin is now spending \$10,000,-

000 for rural highway construction and maintenance and for much of which adequate returns are not gained. If, instead of doing the same work over and over, one-tenth of the road system were properly built each year and then maintained, Wisconsin ten years hence would have a fairly adequate system of roads, and have spent less money than under the present system if continued ten years." A bill will probably be introduced in the legislature for a direct mill tax for road construction and maintenance.

### Road Progress in Virginia.

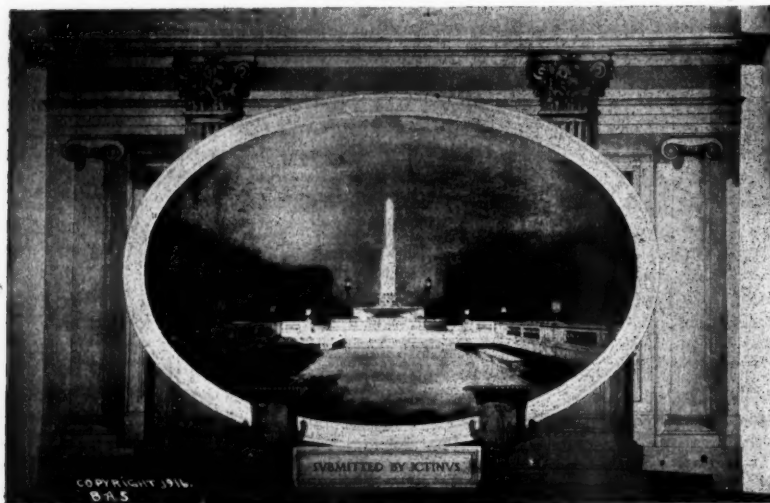
Richmond, Va.—For the first time in the history of the State Highway Commission, every county in Virginia applied in 1916 for state aid in the construction or maintenance of public highways. In his report for the year, G. P. Coleman, highway commissioner states that 1916 was the most successful year the commission has ever known. Road expenditures have been greater, the number of miles built or improved has increased, the class of work has been better than ever before, and there has been a more general interest, he says, in the improvement of roads throughout the state. Mr. Coleman, in making his recommendations for the coming year, voices an urgent plea that convict labor on state and county highways be extended. He declares that every able-bodied man confined in the state penitentiary or county and city jails should be made to work on the roads. He states that the cost of this labor to the state has been only 57½ cents per day for each man. He recommends that each county receiving the use of convict labor be made to pay to the state five cents a day for each man at work. This money would be returned to the men upon their release. The report states that during the year 700 miles of road have been constructed at a cost of \$1,571,957.59, including small bridges and masonry, but exclusive of engineering expenses. In addition 14.77 miles have received surface treatment of oil or asphalt at a net cost of \$13,592.37. Road improvement and repairs of a minor character have also been completed, amounting to \$11,375.59, and maintenance work has been done to the amount of \$23,564.04, in anticipation of the joint state and county maintenance fund.

Convict camps have been opened in 33 of the counties, employing between 1,250 and 1,400 convicts from the state penitentiary, and from 500 to 600 jail men from the various county jails. "It has been clearly demonstrated," says the report, "that no county now using convict labor desires to give it up until the expiration of the time limit as provided by law, and we wish, if possible, to have a sufficient number of camps established to serve all of the counties of the state desiring this class of labor. Unless this is done by the next Legislature, it will be necessary, under the existing law, to transfer some of the camps from the counties in which we are now working to other counties which have made, and are making application for this class of labor." One hundred and thirty-eight bridge surveys with the necessary plans and estimates were prepared during the year for 56 counties of the State; 67 bridges were completed or begun under the supervision of the department, costing \$242,724.64. Of this amount \$85,366.08 represents construction brought forward from the previous year and \$157,358.56 represents the amount of contracts for the year ending September 30, 1916. Bonds were issued prior to October, 1915, amounting to \$7,071,100, making a total of bonds issued to date of \$8,472,800.

The last Legislature, acting on the recommendation of the department, passed what is known as the automobile maintenance law. Under this act all funds derived from automobiles and garage licenses are placed in a maintenance fund to be used by this department in cooperation with the local road authorities of which counties or districts, in the maintenance of roads constructed under the supervision of the State Highway Department. The act requires that counties or districts shall put up an equal amount. The report recommends an extension of the present road force, to take in all of the able-bodied prisoners now used in the penitentiary on contract; these men, as far as possible, to be used in establishing additional convict road camps in counties requiring their services, and we would further recommend that in the case of dangerous or exceedingly long term men, that these be placed in permanent quarries or gravel pits in the preparation of material for various counties of the state in which this material is not now obtainable. The report also recommends that one or more paving brick plants be established in the state, and that some of the long term and dangerous prisoners be used in this work; the brick from these plants to be supplied the counties of the state in their heavy road work.

#### Roads Planned for Panama.

Panama City, Panama.—The National Assembly of Panama has passed a law authorizing the President to enter into an agreement with the United States for the construction of roads and railroads throughout the country, the two governments to bear the expense equally. The roads and other work constructed under this law will be managed and maintained by a joint commission of Panamans and Americans.



#### Pittsburgh Competition on Street Intersections.

Pittsburgh, Pa.—The accompanying illustrations show the prize-winning design in the recent competition of the Pittsburgh Beaux Arts Salon to secure architectural treatment of street intersections, already mentioned in these pages. The competition was open to all architects, engineers and students resident in Allegheny county. Two sets of plans were called for treating an actual existent intersection, with a view to beautification and the improvement of traffic facilities. The designs were to make provision for readjustment of car tracks and to assume that four lots adjoining the present right angle crossing were to be acquired for the improvement. The judges were Frederick Law Olmstead, of Boston, and Benno Janssen and F. F. Nicola, of Pittsburgh. The first prize was won by John P. Morgan, a 21-year-old senior in the School of Applied Design, Carnegie Institute of Technology; the second by W. Pope Barney, and the third by W. T. Ammermen. Eighteen sets of plans were submitted.

## SEWERAGE AND SANITATION

### Typhoid Epidemic.

Harlem, Mont.—The typhoid fever epidemic has spread alarmingly in the past week and there are now about sixty cases in various stages. Some people are dangerously ill, but as yet there have been no deaths. This is the worst epidemic known in the history of the town. Both hospitals are full. There are a number of sick at the hotel, and already a great many have been sent away to Great Falls, Havre and Glasgow hospitals. The epidemic is thought to be caused by the city water which is pumped from Milk river. The health officers have cautioned every one to boil the water and pasteurize the milk. Mayor Arbogast has ordered a liquid chlorine apparatus for the pumping plant.

### Smallpox in Connecticut Towns.

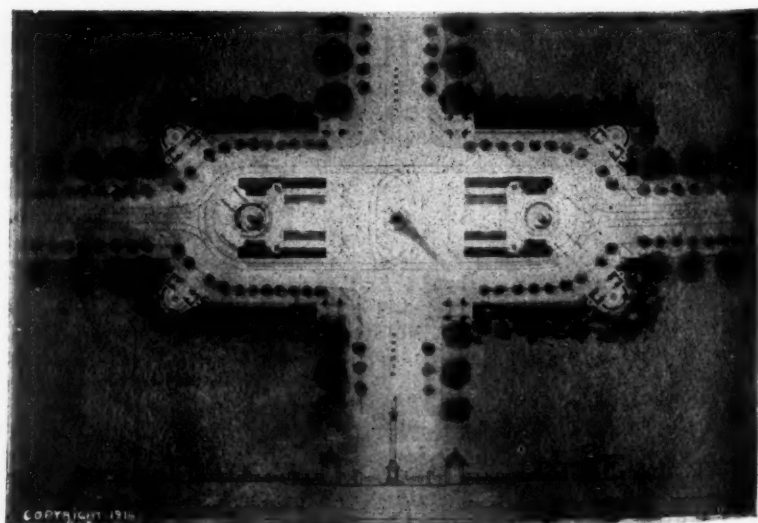
Stonington, Conn.—Over fifteen cases of smallpox in the vicinity of Stonington and Mystic have alarmed the residents of the district and strict measures have been taken by health officers C. F. Congdon and Henry A. Muller to isolate the disease. In one family there are nine cases, and in another there are three. It is estimated that 1,500 persons have been vaccinated in the last few days.

### Licenses for New York Eating Places.

New York, N. Y.—The Department of Health has adopted an ordinance which requires each of the 10,000 restaurants and lunch counters in New York to obtain a license. Failure to comply strictly with the city sanitary code led to this action. The ordinance constitutes one of the most far-reaching steps taken in the history of the city's fight for pure food. For the first time it gives the health authorities direct control of every place in the city where food is sold and consumed on the premises, and even applies to the free lunch counters of barrooms. New York's authorities also have unlimited power to revoke any permit at any time, and thus, without resort to the courts, to inflict drastic punishment on restaurant proprietors who violate persistently the sanitary regulations. Under the new system, as explained by health commissioner Haven Emerson, inspectors of the department who find insanitary con-

#### PRIZE-WINNING DESIGN IN PITTSBURGH BEAUX ARTS SALON COMPETITION FOR THE ARCHITECTURAL TREATMENT OF A STREET INTERSECTION.

Courtesy, Pittsburgh Beaux Arts Salon  
and the American Architect.





ditions in restaurants or similar places will warn the proprietor. Unless he takes prompt steps to conform to the law, his case will be reported to the Board of Health. Ordinarily he will have an opportunity to appear and explain his side, but in extreme cases, as, for instance, where a proprietor has been persistently neglectful, the permit may be revoked without hearing. Heretofore the power of the health officers has been limited strictly to criminal suits in the courts. The unfavorable report of a department inspector has been followed by affidavits charging violation of a specific section of the sanitary code. Pending his trial on these charges, the defendant has been permitted to continue in business, and often has continued the very practices which caused the complaint. The delays made possible by adroit counsel for the defendants in these trials have vexed the health authorities. More than a year ago the department made a survey of the places where food is served and found a large number of unsanitary conditions and practices. Most of the proprietors have shown a disposition to meet the department half way. But there are many who have not. Recently a second survey was made. It will take two and perhaps three months to put the system into effect. Some system may be worked out for the award of certificates of excellence to especially meritorious places. This system for hotels and restaurants is stated as being in force in many cities of the country, including Chicago, St. Louis, Minneapolis, San Antonio, Spokane and San Francisco. In four states, Tennessee, Florida, Wisconsin and Kansas, hotels are so controlled.

#### Smallpox in Arkansas.

Little Rock, Ark.—Smallpox is prevalent in nearly every county in Arkansas, according to Dr. C. W. Garrison, state health officer. He says that the disease is well defined and that the greatest prevalence is in northeast Arkansas and along the Mississippi river. Dr. Garrison says that the continuing spread of the disease throughout the state largely is due to persons returning from the Mexican border. He says he fears the return of the soldiers will render the condition more serious. He has received complaints from Missouri and Tennessee that persons afflicted with smallpox have entered those states from Arkansas. Dr. Garrison said there are only six cases in Little Rock. One came from Hoxie, another from McGehee. The health department is investigating to ascertain who was responsible for sending them here. Five cases of smallpox of mild type have been reported from Bauxite, Saline county. Dr. Garrison recently closed a contract for a large supply of vaccine. Vaccine points are being sent out by the health department at 8 cents a point.

#### Cost of Sludge Removal.

Gloversville, N. Y.—City engineer Harry J. Hanmer has just completed a report on the workings of the sewage disposal plant which points out that the cost of removing sludge from the beds during 1916 was more than double the amount ever paid before in the operation of the plant, which commenced in 1913. The figures reached \$2,780.60. The report of the city engineer follows: Between August 21, 1916, and December 23, 1916, 3,145 cubic yards of sludge were removed from the sludge beds by city labor at a cost of \$1,452.16, or about 46 cents per cubic yard. During the first six months of the year no record was kept of the amount of sludge removed, but assuming that the rate per cubic yard for removing the sludge was the same as during the last six months, the cost for the entire year being \$2,780.60, the total number of cubic yards of sludge removed from the sludge beds for the year would be 6,043. The cost of removing the sludge from the beds for each year that the plant has been in operation is as follows: 1913, \$1,069; 1914, \$973.44; 1915, \$883.86; 1916, \$2,780.60. The increased cost for the year 1916 over that of the former years may be explained as follows: (1) Until the year 1916, the farmers had taken a large amount of the sludge. (2) The city paid a higher rate per day during 1916 than formerly for team hire and labor and (3) the leather mills and tanneries which furnished about 27 per cent of the total amount of sewage operated at a higher rate during the year 1916 than at any time since the plant has been in operation.

## WATER SUPPLY

#### Niagara Falls Waterworks.

Niagara Falls, N. Y.—The amount of water pumped by the municipal pumping station during 1916 was 3,684,270,000 gallons, an increase of 123,214,000 over 1915. The following summary of the annual report on the plant has been officially published: "The city now has 7,500 consumers. During the year 148 new consumers were added. The customers are served by 3,332 meters, 542 having been added during 1916. The total cost of operating the pumping station and filtration plant is \$176.06 less than in 1915, while the income from water sold to customers of the city is \$10,571.12 more than in 1915. The total receipts in this bureau during the year were \$161,858.49. The total outlay in operation, deducting cost of new extensions and material purchased now on hand, is about \$48,325. There was \$74,657.55 in bonds and interest paid out of earnings during the year. This should be an encouragement for those citizens who have continued to purchase water from the city even though it has cost them a little more than it could be purchased for from the rival company. In view of this showing it would seem quite likely that, in the near future, the cost of city water will be reduced at least to the present charge as made by the Western New York Water Company."

#### The Waterworks of Providence.

Providence, R. I.—The city's water works works returned a net profit of \$313,567.18 last year after all payments for interest and maintenance had been met and \$140,000 turned into the depreciation fund, according to figures compiled by city auditor Philip S. Chase. With a single exception the net earnings were the highest in the history of the system, which was inaugurated in 1871. The 1916 figures exceeded the profits of the year before by more than \$30,000. City auditor Chase's report shows that the total receipts last year were \$844,289.48, of which \$806,281.03 came from water rentals and \$38,008.45 from the sale of material. Interest charges of the water debt amounted to \$85,505, while the cost of management and maintenance was \$304,674.69. There was turned into the depreciation and extension fund \$140,542.61. The remaining profit of \$313,567.18 was paid over to the board of commissioners of sinking funds, according to ordinance. The \$30,000 increase in earnings over 1915 was due almost entirely to a reduction of expenditures, the receipts showing an increase of less than \$1,500. Interest charges, however, were \$13,000 less than a year ago, while maintenance costs were nearly \$15,000 under the 1915 figures.

#### Municipal Plants Profitable.

Duluth, Minn.—Duluth's biggest public utility, the municipal water and light department, just passed through the finest year in its history. The annual report of the department shows a net profit for 1916 of \$109,088.40. In 1915 the department made a net profit of \$96,279.94, the figures for 1916 showing an increase of \$12,808.46. A feature of the gain in profits made in 1916 over those of 1915 is that it was caused solely by the increase of consumers. Gas sales increased approximately 7 per cent. in 1916, while the water sales increased 6½ per cent. The report shows that there are now 10,564 water consumers in Duluth, the 10,000 mark having been passed for the first time, while there are 11,425 gas consumers in the city. There are about 1,600 consumers paying flat rates, this number having been cut down from 3,000 in the last few years. It is the aim of the department to reduce the number to the lowest possible figures. At the opening of business on Jan. 1, 1916, there were 9,664 water consumers and 10,625 gas consumers. The net profit for 1916 will be placed in the department funds and the money used in making extensions or retiring outstanding bonds during 1917. Last year a total of \$81,000 in bonds was retired, while the department built approximately twenty miles of gas and water extensions. During the year the wells at New Duluth were built, greatly increasing the water supply of the western end of the city. In listing the expenses for 1916 the department deducted a total of \$71,000

for depreciation. The expenses include the operation, maintenance, depreciation and interest on the bonded debt. The present bonded debt of the water and light plants is \$3,295,000. The condensed income account of the water and light department for 1916 follows:

	1916.	1915.	Increase in Net Income
Water, total revenues..	\$347,369.79	\$326,219.20	
*Water, total expenses..	254,149.81	243,633.21	
Water, net income....	\$ 93,219.98	\$ 82,585.99	\$10,633.99
Gas, total revenues....	289,072.02	268,869.87	
*Gas, total expenses....	273,203.60	255,175.92	
Gas, net income.....	15,868.42	13,693.95	2,174.47
Total income, water and gas .....	\$109,088.40	\$ 96,279.94	\$12,808.46

\*Includes operation, maintenance, depreciation and interest.

During 1917, according to an announcement made recently by manager Reed, the water and light department plans to install a 20,000,000-gallon pump at the Lakewood station, a new pumping station and building for the Woodland reservoir, gas and water extensions from West Duluth to Smithville, Morgan Park, Gary and New Duluth, and about twenty-two miles of mains throughout the city.

## STREET LIGHTING AND POWER

### Municipal Plant Reduces Rate.

Cedar Falls, Ia.—Cedar Falls users of electric light will have their monthly bills reduced approximately 9 per cent beginning May 1, according to action taken by the city council. The enactment of an ordinance reducing the cost was made after superintendent of light and water Streeter submitted a scale of reduced prices, to be made effective May 1 and applying to April bills. Under the new scale the first sixteen kilowatts of current used will be charged at 10½c per kilowatt, the next 100 at 8½, next 200 at 5½ and all over 316 at 4 cents. The half-cent per kilowatt discount for prompt payment of bills will continue in force, making the cost to the average consumer 10c net per kilowatt, as the average consumer uses much less than 100 kilowatts per month. The reduction granted patrons will cut off from \$2,500 to \$3,000 of the light plant's annual earnings.

### Poison Danger in Gas.

New York, N. Y.—A jury empaneled by coroner Frank E. Senior of Brooklyn has decided that the gas sold by the Brooklyn Union Gas Company was unusually dangerous to life and had been the cause of forty-two deaths in January. In recommendations which were sent to the public service commission and to the borough president the jury suggested monthly inspectors of all gas fixtures by the company, the substitution of non-detachable galvanized iron tubes for those now in use and the printing of a warning to householders on all bills. It is said that the amount of carbon monoxide in the gas has been increased from 5 per cent to 30 per cent, and that this is largely responsible for the numerous deaths. Accidental disconnection of a gas tube resulted in death, it was found, even in a room where a window was open. The increase in carbon monoxide is said to have been made necessary by the extensive use of gas for heating.

### Mayor Wins Light Rate Cut.

Cincinnati, O.—Mayor George Puchta has won a substantial reduction in the electric light rate, effective from November 1, 1916, and to continue four years. Costly litigations promised to delay indefinitely the benefits consumers expected from the ordinance passed a year or more ago reducing the price of electric light current from 9½ cents to 8½ cents. By diplomatic handling of the situation mayor Puchta at a conference which he arranged at Columbus has stopped litigation blocking the effectiveness of the ordinance and procured for the people of Cincinnati the benefit of the 1-cent reduction at once. The minimum rate is made 75 cents per month. This adjustment received the assent of the Utilities Commission following statements and explanations by mayor Puchta in behalf of the city and of president W. W. Freeman for the Gas Company. Alternatives open were either a compromise or a long wait for an uncertain result in the courts. President

W. W. Freeman reiterated the company's position that the 8½-cent rate is unenforceable and that the company could not recede from its position to absolutely refuse to permit the ordinance to go into effect. He pointed out that the lower rates are of more benefit to Cincinnati now than at the time the ordinance passed, the company's gross receipts in December, for example, having increased but 11 per cent, while expenses increased 26 per cent. He finally agreed to the compromise. By the terms of the proposed arrangement, the company agrees to withdraw all litigation save that in the Supreme Court to determine whether or not a correct basis of valuation has been used by the Public Utilities Commission. This suit will be continued because the company desires to have the court's decision because of its value at the end of the five-year period, when there may be a revision of rates. The mayor told the commissions that in view of the appraisal of the company's property by the city, it could not expect a rate lower than 8½ cents, while, if the commission accepted the company's valuation, the rate might be higher than 9½ cents.

## FIRE AND POLICE

### Firemen Work in Relays in Zero Weather.

New York, N. Y.—In intense cold amid deep ice and snow, and with a stiff wind blowing, relays of firemen, responding to three alarms, fought a fire which caused from \$250,000 to \$300,000 damage to the building and contents of a five-story loft structure occupied by printing concerns. Three times the benumbed fire-fighters thought they had the blaze under control, but each time the fire got a fresh start and burst through the roof. After fighting the flames for an hour and a half, at the end of which time the interior was completely gutted, tongues of flame, fanned by an increasing wind, shot to the wall of a five-story tenement, in the rear of the burning building. The walls and window frames were licked by the flames and hundreds of occupants were sent out into the cold by captain Mahoney. After the initial streams of water from the high pressure hydrants were directed on the fire, chief Kenlon was compelled to order the firemen to work in relays, owing to the intense cold. Ice formed rapidly on sidewalks, ladders and fire escapes. Huge icicles formed on roof gables and ladders, adding to the danger of the firemen. Ambulance surgeons and Dr. Archer, the fire department surgeon, did their best to relieve the distress of the firemen. The frozen hydrants, which handicapped the firemen greatly, were thawed out after much difficulty. To this trouble was attributed the delay in getting the fire under control.

### Department Reorganization May Follow Big Fire.

Pittsburgh, Pa.—Fire which swept through a section of the retail business district destroyed a department store, the Grand Opera House and a dozen or more smaller buildings, with a loss estimated at about \$1,500,000. Four firemen were seriously hurt and a dozen or more so badly injured that they were removed to hospitals. It appeared for a time as though the fire would sweep the entire square, but heavy fire walls finally stayed the progress of the flames, which ate through the hundreds of tons of merchandise piled in the buildings. The fire is said to have started in the basement of a five-and-ten-cent store shortly after midnight, but did not reach its height until shortly after 4 o'clock. A general alarm was then sounded, but the flames, hidden from view by dense clouds of smoke, had made such progress into the adjacent buildings that they were seen to be doomed. Firemen were seriously handicapped by the severe cold, it having been necessary to carry hot water from neighboring restaurants to thaw street hydrants before streams under pressure were available. The roof of the opera house collapsed during the height of the fire, carrying with it walls of several adjoining structures. Several explosions, which followed, did much to scatter the fire. The ruins smoldered for many hours after the flames were out. A cordon of 100 police surrounded the building for several days and cars were rerouted. Fire underwriters have indicated that the blaze may have had an incendiary origin and investigation by the city council followed one by fire marshal Thomas L. Pfarr.



Marshal Pfarr, Richard J. Trimble, secretary of the board of fire underwriters of Allegheny county, and other insurance men insisted that the fire department should be blamed for a great deal of the loss and the insurance companies are using the fire as a strong impetus for radical changes in the administration of the local department.

Trimble indicated that failure of the city officials to enforce the law had resulted in the conflagration. The property swept by the fire was known to the underwriters as a "bad exposure group," he said, and city officials had repeatedly been warned that it constituted a dangerous fire menace. It was specifically mentioned in the report of the National Board of Fire Underwriters in 1915, he said. Following the survey made at that time, Mr. Trimble continued, the underwriters had asked the city to enforce the ordinance compelling owners and tenants to equip with automatic sprinklers. This was urged particularly for the basements of these buildings, he remembered. It was in the basements that the fire got its headway. "The fire never could have got out of the basements if there had been sprinklers in that building," Mr. Trimble commented. "Following this warning, W. H. Coster, fire prevention inspector, presented an order to the tenants about the sprinklers," said Mr. Trimble. "The city did not follow it up, though it has the power through an ordinance on the sprinkler matter and by an act of legislature which confers the power to prosecute in the event of a refusal to obey a city ordinance after a certain notice. The multitude of openings between division walls, exposed windows and other aids to the sweep of a fire constituted the particular danger to which the underwriters objected," he said. "That the big fire was handled very poorly we are fully convinced, and that had it been properly handled, we know it could have been checked almost at the start, and that had the fire department been competent, it could at least have prevented the destruction of the opera house building. I say this because I know that the latter building caught fire at the cornice. Had the fire department used the water tower which was at the scene of the fire early, but never put into operation, sufficient water could have been kept playing on and around the cornice and roof of the opera house to keep that building from being destroyed." Pfarr said that the companies which attended the fire were not properly manned, and that the underwriters are insisting that each downtown engine, hook and ladder and chemical company be manned fully, engine companies to have at least eight members, hook and ladder companies seven and chemical companies six each. Secretary Trimble handed to the councilmen copies of the national board's plan for getting the fire bureau out of politics. It provides as follows:

"All appointments and promotions should be made from civil service lists, prepared by an honest and impartial commission. The chief should be appointed only after suitable examination, which need not be competitive, but should be severe in administrative and technical subjects and high rating required for eligibility. For assistant chief admit to examination only such captains as have at least one year's experience as captains and five years' experience in the department. Require a stiff mental and physical examination allowing seniority and conduct to weigh. Appointments should be made from the top of the eligible list. For company officers require at least four years' experience in the department and a stiff mental and physical examination. For original appointments require a severe physical examination and the mental examination required of a 14-year-old boy in the public school. Examinations should be competitive. Make the age limit for appointment from 21 to 35 years, minimum height limit, five feet seven inches; minimum weight limit, 150 pounds. All appointments should be probationary for six months. A month's course in drill school should be required of all new appointees."

#### Many Killed in Tenement Gas Explosion.

Chicago, Ill.—Forty persons were killed and as many were injured as the result of an early morning gas explosion and fire that wrecked a three-story tenement in the heart of the west side. Injured persons and residents forced from their homes scantily clad suffered miserably in a temperature of 10 degrees below zero and the cold hindered the work of firemen and rescuers. Burning gas from a main prevented search of the ruins, and at day-break only two bodies had been recovered. The explosion was heard for miles, and by some freak of the shock buildings a few yards away were unharmed, while windows were broken many blocks further distant. The explosion wrecked one end of the tenement building which contained

twenty-four flats, sixteen of which were occupied. The flames burst throughout the lower story immediately. A leak in a gas main, known to have existed for more than a year, according to police, is believed to have resulted in the explosion that wrecked the twenty-one apartment building. Danger of other explosions added to the terror of the neighborhood. Fires broke out from leaking gas mains along the streets around the building, and firemen and gas company employes worked in constant danger. spurts of flame shot up from the pavement in a score of places along a number of nearby streets. When the firemen arrived at the scene of the explosion they saw men and women in the upper windows throwing their babies down to those in the street below. Others, fearful of being caught in the crash of the building walls, jumped to their death. A few moments after the firemen and police had formed a cordon about the building, the walls of the north wing fell, damaging a frame structure into which many of the injured had been taken. Several of the policemen caught the children as they were thrown by their parents from the windows of the burning house. Other policemen and early arrivals among the spectators formed human ladders, by standing on one another's shoulder, and thus were able to rescue those in the building. Seven investigations of the blast were under way by 7 o'clock in the morning. These separate inquiries were begun by the coroner, the police, headed by lieutenant McGeehan, by the fire department, attaches of chief deputy state fire marshal A. A. Bach, the People's Gas Light and Coke Company, the city building department and the city health department. Representatives of the latter departments interested themselves because of reports that reached lieutenant McGeehan that the tenement had been condemned because of poor construction and sanitation.

#### General Alarm for Big Store Blaze.

Hartford, Conn.—The worst fire in Hartford's history, in point of financial loss, with the sole exception of the great \$2,000,000 Colt Armory fire in 1864, occurred when a big department store, a five-and-ten-cent store and a group of buildings were destroyed in an all-night blaze. The fire, thought to have been of incendiary origin, for a time threatened the city's entire shopping district. The loss is estimated at nearly \$700,000. A big store building adjacent was saved after a hard fight. More men and apparatus were put in service against the fire than on any other occasion in the city's history, for it was the first general alarm since the department reached its present size. Every piece of apparatus in active commission was called out. Chief Morgan called into use for the first time the special signal for second and third alarm combined. This started on the road every company left in quarters, seven answering direct to the fire and five moving in towards the center to stations left uncovered. Six steam engines and six gasoline pumpers were all put hard at work, supplying among them all something like twenty-seven lines of hose. Several of the pumpers worked three lines each and all gave a good account of themselves. All the apparatus came through the ordeal in good shape. Most of the squads worked from twelve to eighteen hours at the fire. The New Britain, South Manchester, Springfield and New Haven fire departments held apparatus and men in readiness to help the local department if necessary.

#### Difficult Fire in Wholesale District.

Boston, Mass.—Boston's fire department, in the face of difficulties seldom encountered, prevented a conflagration in the wholesale district by checking the spread of a \$400,000 blaze that destroyed a five-story building used by dry-goods businesses. Five alarms were given and the fire was checked after it had worked its way into two adjacent buildings. What caused the fire is not known. At 1.50 a. m. a burglar alarm from the building sounded in the office of the American District Telegraph Company. Three minutes later the Boston Automatic Fire Alarm's system recorded an alarm from the basement and a minute later a policeman gave a bell alarm. The sounding of the burglar alarm caused the belief that a fire might have been started to cover up a safe blowing job. The heat scorched the

horses hitched to the engine, as that machine stopped at the hydrant and the animals refused to stand. District chief Coulter's automobile stopped at the box and an instant later was smouldering in the blast of heat. Volunteers pushed it to safety. The chief's driver was ordered to sound extra alarms, but, instead of being able to stand at the box and telegraph for third or fourth alarm apparatus, skipping the calls between, he was forced to shield his face with a rubber coat, run to the box, pull the hook once and then dart back out of the heat zone for a few seconds' respite, then run back and pull another alarm. In this way five calls were given within five minutes. The water towers proved particularly valuable. It was not until 11 a. m. that the "all out" signal was given. Two firemen were hurt, but all suffered from the cold.

## GOVERNMENT AND FINANCE

### Dayton Charter Attacked.

Dayton, O.—An injunction restraining the city of Dayton from paying city manager Henry M. Waite his salary of \$12,500 is asked in a petition filed in common pleas court here by attorney Ira C. Koehne, a taxpayer. The plaintiff contends the city charter is unconstitutional and void under the Ohio and federal constitutions and that the office and powers of the city manager are non-existent because of the unconstitutionality of the city commission, which usurps legislative and executive powers.

### Report of State Commission on Municipalities.

Trenton, N. J.—Advocating the sweeping away of what are pointed out as haphazard methods in which municipalities have obtained special legislation and thus cluttered up the statute books of the state, a special commission, named by governor Fielder a year ago, has submitted a report to governor Edge and the legislature, advising how best to give to municipalities the greatest measure of home rule consistent with constitutional requirements. Accompanying the report was a bill designed to carry out the conclusions of the commission and containing a repealer which would wipe out more than one thousand statutes. Should the commission's bill become a law, New Jersey municipalities would suddenly come into possession of powers they have been fighting for for years. The commission submitted a single bill, with thirty-seven subdivisions, and in only one instance does there appear to have been any division of opinion in the work of revising the statutes. This has to do with the question of local option. In its proposed legislation the commission does not disturb the structure of government of the hundreds of municipalities. It provides for the same amount of authority for each municipality, without regard to size or population. In refraining from extending to municipalities the principle of home rule, under that broad term, the commission explains it is with the idea of avoiding controversy and possible litigation by citizens who would question the action of a governing body. On the question of local option the report says: "The commission unanimously feels that the important work presented by it should not be considered or acted upon in connection with this subject (local option), upon which the policy of the state is still unsettled. Mr. Stanger proposed a separate bill on this subject containing local option features. The majority of the commission feels that the question of the regulation or prohibition of the sale of intoxicating liquor is one of more than local concern, and not within the province of the commission, and therefore no recommendation is made concerning it."

### Mayor and Chief of Police Indicted.

Seattle, Wash.—The long expected indictments against mayor Hiram C. Gill, chief of police Charles L. Beckingham and former sheriff Robert T. Hodge, charging conspiracy to violate the interstate commerce and federal liquor laws and acceptance of bribes, have been returned by the United States grand jury and warrants were placed in the hands of deputy marshals for the arrest of these defendants and ten others who were indicted. Others indicted were four

city detectives, Meyer M. Peyser, John Poolman, James E. Boom and Dan J. McLennan, who are charged jointly with Gill, Beckingham and Hodge in two counts. Former policeman C. J. Mullen was indicted, charged with attempting to intimidate the Billingsleys, government witnesses, in an effort to induce them to jump their bond and flee to Canada. The others include liquor dealers and express company men. All of the defendants, thirteen in number, are charged jointly with conspiracy in one indictment, with the exception of Mullen, who is accused singly. Mayor Gill, chief Beckingham and Hodge, together with the four city detectives, who are former members of the waterfront division of the police dry squad, are charged with plotting with the Billingsleys to ship huge quantities of whiskey into Seattle under organized official and police protection. Mayor Gill is accused by the government with having accepted a bribe of \$4,000 last summer from Logan Billingsley at the time the alleged conspiracy began. Several instances where chief Beckingham took substantial bribes from the Billingsleys, and in which, it is charged, he aided them to steal liquor consigned to other persons, are alleged by the federal authorities in the charges against the police officials. The mayor, who had looked for the indictment, issued a statement early in January, in which he defied his enemies and declared he would prove his innocence of any charge made against him.

Mayor Gill's recent career has been stormy. In March, 1910, after he had been in city politics twelve years, most of that time councilman, Gill was elected mayor of Seattle. Almost immediately his administration was assailed for alleged toleration of vice, and in the spring of 1911 Gill was removed from office by the recall, with women voting for the first time. Subsequently Charles W. Wapenstein, Gill's chief of police, was sentenced to the state penitentiary for accepting a bribe. Gill ran for mayor in 1912, asking vindication, and was defeated; but in 1914 he was elected mayor by an enormous majority, running as a good government candidate, and being supported by many persons who were prominent in the movement that recalled him. Gill was re-elected mayor in March, 1916. When the prohibition law was adopted Gill promised that it would be rigidly enforced, and raids upon bars at which liquor was sold in violation of law resulted in demolition of fittings valued at nearly \$100,000 and seizure and demolition of vast supplies of liquor. Gill has been a champion of the prohibition law, writing and speaking in its favor and receiving much commendation from prohibition leaders. Logan and Fred Billingsley were the owners of one of the drug stores demolished by the police, and stores of liquor owned by them were seized and destroyed.

## TRAFFIC AND TRANSPORTATION

### Proposed Subways for Cleveland.

Cleveland, O.—Submission to the voters of a \$5,000,000 subway bond issue has been formally recommended to council by street railway commissioner Fielder Sanders. The commissioner advocates construction by the city of a street railway subway terminal and tube approaches to Public square, to be leased and operated by the Cleveland Railway Company, as a solution of Cleveland's traffic congestion problem. The proposal is made after trips by the commissioner to study the subway systems of Boston, New York and Philadelphia, and the proposed system of Cincinnati. It is proposed that the terminal station in the square have three tube approach divisions. It is suggested that the city engineer's office, or commissioner's office, or both, prepare plans in collaboration with railway company engineers and that the commissioner, with the advice and subject to the approval of council's street railway committee, enter into negotiations with the Cleveland Railway Company to make a contract for leasing and operating. In the meantime, as an immediate relief for congestion, commissioner Sanders recommends another attempt by council to bring about distribution of rush hour evening traffic over a longer period than one hour; advertisement of the East 9th street trippers to induce people to use them, and either the building of new tracks in Public square, or addition of new loops and an increase in rush hour service on east, west and south loops outside the square. One important proposal of the



commissioner in his communication to council is that "the company should in its leases grant to the city wider and fuller control of operating than the mere supervision of the Tayler grant. Definite rights to control operation and individual conduct of operating officials should be in the city, he says, not only to insist upon the car riders getting full service, but to protect the people's investment."

Commissioner Sanders states to the council that the problem of congestion in the square has become so acute in the last three months as to call immediately, not only for temporary relief, but for adoption of a plan of permanent solution. To show the situation, his report gives figures on a count made by the commissioner's office employees Saturday, Jan. 20, from 2 p. m. to 6.15 p. m. Tab was kept on inbound and outbound traffic on the edges of the business district. The count showed these results: Inbound—5,880 automobiles, 1,187 wagons; outbound—7,796 automobiles, 1,305 wagons; standing in district in same period—10,056 automobiles, 1,230 wagons. The commissioner asserts the speed of operation of Cleveland street cars has made 3-cent fare possible, and so far has made 5-cent rapid transit tube operation financially impossible. But this speed now is breaking down because of traffic interference, he declares. Long rapid transit systems are proving expensive, and such a system is not needed here, the commissioner believes. Discussing the alternative possible remedy of removing all vehicle traffic from the congested district as a solution, the commissioner says there are arguments in favor of the plan. But he adds that "an adequate system of street railway transportation free from traffic interference is vital to the prosperity and growth of the community as a whole." The commissioner goes into some detail of construction possibilities, urging a terminal central station, built with a mezzanine floor above and entrances to many loading platforms. He says the initial program lends itself to possible eventual extension into a complete surface and subway system for the city and suburbs for the future.

#### Grade Crossing Elimination.

Detroit, Mich.—H. E. Riggs, professor of civil and railroad engineering at the University of Michigan, will assist the city in working out a grade separation plan for the forty-two Grand Trunk crossings between Franklin street and Ferry avenue. He has been retained by George H. Fenkell, commissioner of public works, who recently was authorized by the common council committee on grade separations to obtain the services of a consulting engineer. Grade separation plans are now in the hands of J. W. Reid of the city engineer's staff, who has been relieved of all other work. Professor Riggs will be called in whenever his advice is thought necessary.

#### Finances of San Francisco's City Railway.

San Francisco, Cal.—Municipal Railway receipts for the calendar year of 1916 amounted to \$1,467,484.51, according to a statement issued by the Board of Public Works. This income brings the total revenue of the city-owned street railways system from December 28, 1912, when it commenced operation, to date, to \$5,356,477.80. The net profit of the road to November 30 last year, after all operating expenses and transfers are deducted, is figured at \$237,294.22 by the Board of Works. A detailed report to November 30, last year, shows that the cash fares from operation for the three years and eleven months the road has been operating totals \$5,207,710.71. Other income sources are added to the total revenue as follows: Interest on bonds purchased for investment, \$15,079; sale of property on Church street, acquired by condemnation, \$2,279.52; accounts receivable, \$3,892.55. Total income to November 30, last year, \$5,228,961.78. With the December receipts of \$127,516.02 added to this total, the income to date is \$5,356,477.80. The operating expenditures of the road for the period to November 30 were \$2,971,249.52, the Board of Works sets forth. Other disbursements were as follows: Paid for injuries and damages, \$34,203.85; injury insurance payments, \$1,130.20; bond interest payments, \$545,529.53; bond redemption, \$202,000; outstanding liabilities, \$4,419.48. Total, \$3,758,532.58. Transfers of miscellaneous character account for \$179,985.90 additional in expenditures. A total

of \$1,053,149.08 is deducted from the gross revenue to November 30, 1916, for depreciation, investment funds and an injury insurance fund as follows: Investment fund, \$200,000; depreciation fund, 18 per cent of gross passenger revenues, less amounts paid for bond redemptions and injuries and damages, \$975,156.52; insurance injury fund, less payments, \$57,992.56. October was the banner month of travel on the municipal road last year with a total of \$133,945 in gross receipts. June was the lowest, with \$114,633. Superintendent Thomas A. Cashin, in commenting on the annual fiscal report of the Municipal Railways for the year ending June 30, 1916, sounds a note of warning against further drains on the system from lines that do not pay. Among the burdens which the Municipal system has been forced to carry by City Hall action and popular votes, Cashin instances the \$500,000 expended on the Church street line. "This money is drawing interest," Cashin says, "while that line is not earning a penny. And from the surplus earnings of the municipal system there has been taken \$48,000 for the Stockton-street tunnel. Contracts have also been let for the construction of five motor buses at \$25,000, to run across Golden Gate Park, and \$80,000 for the completion of the Church-street line also came from the surplus earnings." Cashin makes the point that these drains on the resources of the Municipal Railways must be stopped. And he adds that there is still the \$425,000 to be provided for the tracks through the Twin Peaks tunnel. "The Municipal Railway is also giving service on some of the present lines better than the earnings warrant," Cashin continues. "It is also a question whether the city can afford to renew the 60-40 transfer contracts with the United Railroads. It is a burden to the city system. We cannot build up the system, give service and at the same time lose money in transfers and extensions that do not pay. The people should choose what the policy in this regard is to be," he says.

#### Street Fatalities Increase.

New York, N. Y.—Figures compiled by the bureau of records of the department of health, show that for the first eleven months of 1916 there were nearly 18 per cent more deaths in Greater New York due to street vehicles and surface cars than in the corresponding period of 1915. There was a much greater percentage of increase in deaths due to falls on streets and sidewalks and falls from wagons, cars, or other vehicles. The figures follow:

	1915.	1915.
Street vehicles.....	529	453
Electric surface cars.....	96	77
Falls on streets and sidewalks.....	81	50
Falls from wagons, cars, etc.....	59	46

"This showing is remarkable," said commissioner Emerson, "in view of the large amount of educational safety first work carried on in this city during the last few years, and especially in view of the improved traffic regulations in recent years. The figures indicate the need of still greater efforts in this direction."

#### Five Killed in Interurban Crash.

Cleveland, O.—Five men were killed and sixteen persons injured when two Cleveland, Southwestern & Columbus interurban cars smashed head on near Strongsville, southwest of this city. The terrific impact telescoped the front of a northbound package car fifteen feet into a southbound local passenger car, crowded with men, women and children. The cars caught fire from the stoves and live wires. Shrieks arose from passengers imprisoned in the wreckage as a burst of smoke and flame enveloped both cars. Two men died in the fire, and the body of a third, killed in the crash, was incinerated. An unidentified Italian, wedged between two seats, slowly burned to death. His screams were heard a great distance as he vainly writhed and struggled to pull himself from the creeping flame. Five Cleveland people were among those hurt. According to the stories of rescuers, and according to word given officials at company offices here by their dispatcher, the wreck was caused by the northbound electric package car running past a switch where it should have gone on a siding just north of Brunswick village, between which place and Strongsville,

just over the Medina county boundary, the crash occurred. The accident happened on a sharp curve, each approaching car being hidden from the sight of the other by a wood along the curve. The motormen only caught a flashing glimpse of each other before the cars struck. Orr H. Dawson, chief electrician of the railway company, died in the wreck.

## MISCELLANEOUS

### City Planning for Fresno.

Fresno, Cal.—The city council, following the recommendation of the city planning commission, has empowered mayor A. E. Snow and Miles Humphreys, president of the city planning commission, to arrange with Charles H. Cheney, consultant in city planning, for an exhaustive survey of the city, and various reports, with complete recommendations for correcting existing evils and improving civic structural conditions in general. Prof. Cheney will receive \$1,500 for his services. The work of the expert will be as follows:

1. To present in 30 days from date of the contract a preliminary report on the railroads and transportation in Fresno in relation to the city plan, after conferences with the railroad engineers and the State Railroad Commission, and to submit recommendations as to grade crossings and street railroads.
2. To present in 60 days a final report on the railroad and transportation problem in Fresno, including a report on the possibilities for a Union Station with diagrams, a map of the railroad owned properties in Fresno, and a brief industrial survey, showing why industries come to Fresno, with suggested plans for improvements that might attract more industries, and a report on the relation thereto of public utilities, water, and fire protection.
3. To present in 90 days a report on the zoning or districting of the city, together with a map showing locations and use of existing buildings, report on housing and living conditions, with recommendations for further building regulations and the limitations of the heights of buildings; also maps showing the range of land values, with deductions therefrom.
4. To present within four months a general survey of the street plan and traffic arteries with a suggested paving program, including maps showing the present pavement, traffic studies, studies for a continuous boulevard system, secondary thoroughfares, and minor, residence streets, with recommendations thereon.
5. To present within five months a report and studies for a Civic Center, with a general outline of the park system in the city.
6. To present within six months a general city planning report for Fresno, with recommendations and deductions, including plans, diagrams, and photographs, and also a program for the next year's work of the city planning commission.
7. To visit Fresno personally at least two days each month during the life of the agreement in a consulting capacity to the city planning commission, and to keep in close touch with the commission during the period of the work.

### City Employees on Strike.

Two Harbors, Minn.—Employees of the city, exclusive of the electric light and power plant and employees in the city hall, went out on strike because the city did not grant them an increase in wages. The strike affected employees in the street commissioners' department and also those employed at the municipal coal dock and the municipal ice plant. The employees had presented a petition to the council a week before requesting that their wages be raised. While the council did not flatly refuse the request it was tabled and then after nothing was done on the matter at the following council meeting the men took a strike vote which was unanimous. The total number of men out was twenty-five.

### New City Plan Commission Named.

Erie, Pa.—Members of the new city planning commission have been appointed by mayor Miles B. Kitts. The members are A. Matthew Hess, cigar manufacturer; S. Yake, clerk, cigar store; P. J. Grant, contractor; J. A. Root, a physician, and William P. McAndrew, a printer. Mr. Hess and Mr. Yake are former councilmen. Mayor Kitts has been to Harrisburg to confer with former colleagues in the legislature regarding enactment of legislation giving the city planning commission power to control development of property within the three-mile zone. The body now has \$500 to spend, but if the proposed law goes through more money probably will be made available. Mayor Kitts explained that the reappointment of the commission will not affect the bureau of engineering, which supplanted the previous city plan commission, but it is probable that the bu-

## LEGAL NOTES

### A Summary and Notes of Recent Decisions— Rulings of Interest to Municipalities

**Number of City Employees—Power of Council to Reduce.** (Wash.) A city council has power to reduce the number of city employees in the interest of economy.—*Kessler v. City of Seattle*, 160 P. 423.

#### Ordinance—Validity.

(Me.) If a city ordinance is passed under general law authorizing regulations for health, safety, and welfare, the courts may declare it invalid if in contravention of Constitution or existing statute, or if unreasonable or discriminatory, even though not in conflict with Constitution or statute.—*State v. Maheu*, 98 A. 819.

#### Sewerage System—Power to Construct.

(Ky.) A city of the fourth class empowered by charter to make all regulations necessary to secure the general health of its inhabitants and construct sewers had power to construct and maintain sewerage system as a public necessity, if such duty was not imposed by Ky. St. § 3490.—*City of Princeton v. Pool*, 188 S. W. 758.

#### Treasurer—Where Money Should Be Kept.

(N. Y.) Under Laws 1895, c. 785, tit. 4, § 6, under which a village was incorporated, silent as to where treasurer should keep its money, he is only required to keep his accounts accurately and pay money on warrants duly issued by the board of trustees.—*Trustees of Village of Bath v. McBride*, 113 N. E. 789, 219 N. Y. 92.

#### Charter—Power to Impose Wheel-Tax.

(Minn.) The adoption of a home rule charter by a city is legislation, and the authority it furnishes city officers is legislative authority. Where a former city charter authorized the council to impose a wheelage tax on vehicles and a later charter gave the city all the power possessed theretofore, subject to restrictions in the new charter, the power to impose a vehicle tax was continued.—*Park v. City of Duluth*, 159 N. W. 627.

#### Charter—Street Widths—Power to Regulate.

(Tex. Civ. App.) Under Houston City Charter, art. 2, § 4, empowering the city to lay out, widen, and vacate streets and sidewalks, the city could regulate the width of sidewalks and abolish them if traffic should warrant, unless some private rights protected by Constitution were impaired.—*Jones v. City of Houston*, 188 S. W. 688.

reau will suspend its activities after passing on maps for three subdivisions. Coincident with the naming of the planning commission, the engineering bureau submitted a report of its work since its appointment on June 3, 1915. Commenting at length on efforts of the bureau to have streets opened in the three-mile zone correspond with city streets, the report stated that many obstacles had been encountered. The tendency now is to have streets and driveways follow the contour lines of the land to avoid the expense of filling and grading, and at the same time using the semi-waste places for parks, groves and ponds, the report stated. The development of numerous subdivisions of suburban property during the past five years, in which the streets are out of harmony with the city streets, makes it necessary to partly abandon the idea of direct connection, the report continues, but a part of the original planning can be preserved and should be applied to the rural districts by continuing in their proper lines the streets that have not already been diverted. The report recommends the preparation of a map or atlas of the three-mile zone on a large scale and then, in conjunction with the township supervisors and county officials, designate the streets and highways necessary to be opened within a reasonable time, keeping in mind the adaptability of such streets to connect with existing city streets. Utilization of rough places for parks and groves is commendable, the report concludes, but it can be carried too far and seriously disarrange existing streets.



## THE MUNICIPAL INDEX

In Which Are Listed and Classified by Subjects All Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Leading Periodicals.

It is our purpose to give in the second issue of each month a list of all articles of any length or importance which have appeared in all the American periodicals and the leading English, French and German ones, dealing more or less directly with municipal matters. The index is kept up to date, and the month of literature covered each time will be brought up to within two or three days of publication. Our chief object in this is to keep our readers in touch with all the current literature on municipal matters. In furtherance of this we will furnish any of the articles listed in the index for the price named after each article, except that where an article is continued in two or three issues of the paper, the price given is for each of said issues. In addition to the titles where these are not sufficiently descriptive or where the article is of sufficient importance, a brief statement of its contents is added. The length also is given, and the name of the author when it is a contributed article.

## ROADS AND PAVEMENTS.

**Accounting.**

Road Accountancy. System used by Engineer of Garfield County, Washington. Designations assigned to roads and bridges and forms for monthly report. By R. W. Riggsby, County Engineer. 1,250 words. Municipal Journal, January 11. 10 cts.

Accounting Needs in the Street Department. By Walter M. Frickstad, 2,500 words. Pacific Municipalities, January. 25 cts.

**Bituminous.**

Cold Bituminous Mixtures for Plank Floors for Highway Bridges. By B. H. Peipmeier, Illinois State Highway Department. 2 ills., 900 words. Engineering News, January 11. 15 cts.

**Brick.**

Concave Brick Pavements in Winona, Minn. 1 ill., 1,000 words. The Contractor, January 1. 20 cts.

**Concrete.**

The Concrete Road. Discusses width, reinforcement, shoulders, maintenance, etc. By E. N. Hines. 1,200 words. Pacific Municipalities, January. 25 cts.

Concrete Pavement in Sioux City, Ia. 800 words. Engineering and Contracting, January 3. 10 cts.

How Sioux City Secured 46 Miles of Automobile Roadway. By Frank Walklin. 3 ills., 3,000 words. American City, January. 50 cts.

Suggestions as to the Cause of Cracks in Concrete Roads and Concrete Bases. Letter from Howard W. Holmes, Consulting Engineer, Portland, Ore. 1,700 words. Engineering and Contracting, January 3. 10 cts.

**Construction.**

Road Building in Kane County, Ill., with County Outfits. By George N. Lamb, County Superintendent of Highways. 4 ills., 2,200 words. Engineering and Contracting, January 3. 10 cts.

Hudson River Road Built on Mountainside. Difficult side hill road building on west shore of Hudson River near Nyack, N. Y., is described. By Eugene Geduldiger. 5 ills., 1,200 words. Engineering News, January 4. 15 cts.

**Costs.**

Detailed Cost of Surfacing Highway with Caliche. 2 ills., 2,500 words. Engineering and Contracting, January 3. 10 cts.

**Foundations.**

Stone and Concrete Pavement Foundations. Conditions under which each will give good results. Rolling base on sand fill. Various concrete foundations. From a paper by George C. Warren. 3 ills., 1,750 words. Municipal Journal, January 4. 10 cts.

**Granite Block.**

Street and Road Pavements—the Construction and Maintenance of Stone Block Pavements. By R. K. Compton, Chairman Baltimore Paving Commission, and others. 4 ills., 6,000 words. Municipal Engineering, January. 25 cts.

Physical Tests for Granite Block. No satisfactory tests or determining relative values for paving yet established. Crushing, impact and French coefficient of wear. From a paper by C. D. Pollock. 1,250 words. Municipal Journal, January 4. 10 cts.

**Gravel.**

Gravel Road Construction in Iowa. Materials, methods of construction and maintenance. 1 ill., 2,250 words. Engineering and Contracting, January 3. 10 cts.

Gravel Road Construction and Maintenance in Wisconsin. Methods. 2,500 words. Engineering and Contracting, January 3. 10 cts.

Wisconsin Methods of Gravel Road Construction. Substantial foundation, careful gravel selection, crushing of oversize, even spreading and early maintenance are essential features.

1,750 words. Engineering Record, January 20. 15 cts.

**General.**

Rail Fillers and Key Blocks Prolong Special Work Life in New York City. 4 ills., 1,000 words. Electric Railway Journal, January 6. 10 cts.

Making a Success of Road Contracting. A summary of the factors that need attention. By H. E. Breed. 2,500 words. Engineering Record, January 6. 15 cts.

Road and Pavement Economies. From a paper by J. W. Howard. 2,000 words. Pacific Municipalities, January. 25 cts.

Clinker Mephalt Roads and Disposal of Refuse Destructor Clinker at Abertillery. By L. D. Lewis. 1,500 words. The Surveyor. 40 cts.

**Maintenance.**

Resurfaced Waterbound Macadam with Asphalt Macadam. For 37 cts. a sq. yd. surface was brought to good condition. 2 ills., 700 words. Engineering Record, January 27. 15 cts.

Rebuilding with Permanent Surface Old Macadam Roadways. By C. A. Caruth. 1,200 words. Engineering News, January 4. 15 cts.

Rebuilding with Permanent Surface Old Macadam Roadways. Discusses resurfacing this type of highway. By Theron Ripley. 1,100 words. Engineering News, January 11. 15 cts.

Building an 8-Inch Macadam Pavement with Tar and Gravel Top. Description of a New Jersey road of an unusual design. By H. M. Olmstead. 2 ills., 1,300 words. Engineering News, January 25. 15 cts.

Suggestions on Maintaining Concrete Roads and Streets. Cracks, small holes, slight depressions and deep holes are discussed. 900 words. Engineering and Contracting, January 3. 10 cts.

Maintenance Cost of Concrete Roads in Illinois. Average cost per sq. yd. was 0.4 cts, and figures are given for nearly all the counties. 1,100 words. Engineering and Contracting, January 3. 10 cts.

Cutting Long Strips of Pavement. Inexpensive machine, made for a special job, operates at low labor cost. By M. E. Stark. 2 ills., 500 words. Electric Railway Journal, January 20. 10 cts.

Drill Cutting Asphalt Pavements. Method of removing pavement to make a patch. 600 words. Municipal Journal, January 11. 10 cts.

**Oiling.**

Experimental Oil-Limestone and Sand-Asphalt Road Constructed at Ocala, Fla. 2,000 words. Engineering and Contracting, January 3. 10 cts.

Oiled Road Built Through Mojave Desert, for \$950 Per Mile. Eight-foot strip treated with 2½ gallons of oil per square yard, worked with harrows and rolled with horse-drawn rollers. By J. S. Bright. 3 ills., 1,500 words. Engineering Record, January 13. 15 cts.

**Traffic.**

Traffic Census and Pavement Maintenance. A study of the relations between the two. By H. F. Harris. 4 ills., 1,500 words. Municipal Engineering, January. 25 cts.

Concentration of Traffic on Highways. Results of traffic census in Essex County, N. J. 1,000 words. Engineering and Contracting, January 3. 10 cts.

## SEWERAGE, DRAINAGE AND SANITATION.

**Activated Sludge.**

Activated Sludge Power Costs. Diagrams giving costs of air-blowing in new activated sludge sewage purification process. By G. J. Requardt. 3 ills., 1,000 words. Engineering News, January 4. 15 cts.

Activated Sludge Process of Sewage Disposal Firmly Established. Experimental work has solved most of the problems, but sludge dewatering is still an economic problem. By T. C. Hatton,

Chief Engineer, Milwaukee Sewerage Commission. 2,750 words. Engineering Record, January 6. 15 cts.

**Drainage.**

Studies of Dredged Drainage Ditches Before and After Clearing. Carefully made hydraulic observations on the flow. By C. E. Ramser. 5 ills., 1,500 words. Engineering News, January 18. 15 cts.

Earth Lining Prevents Seepage in Porous Shale. Operation and work on 37-mile canal in Colorado. 1,500 words. Engineering Record, January 20. 15 cts.

Methods and Cost of Location Surveys for Missouri Drainage District. Discusses proper size and equipment for parties, work done and costs. By B. F. Burns. 1 ill., 2,500 words. Engineering and Contracting, January 17. 10 cts.

**Filters.**

A New Type of Trickling Filters. Consists of a lath or brush filter by which a very high degree of nitrification has been effected. By Lieut.-Col. G. G. Nasmith. 1 ill., 2,000 words. Surveyor, January 5. 40 cts.

Travis Tank and Sprinkling Sewage Filters at Rio Janeiro. These are used with automatic reverse-travel sewage distributor. By C. J. Seiber. 3 ills., 1,800 words. Engineering News, January 18. 15 cts.

**Flow.**

Sewage Flow Measurement in Austin, Texas. Complete measurement of flow of sewage. By Julian Montgomery. 1 ill., 700 words. Engineering News, January 11. 15 cts.

**General.**

Cave Over Mine Complicates City's Sewerage Problem. Plume on jacks will carry storm and mine water. Disposal plant not recommended. 1,250 words. Engineering Record, January 27. 15 cts.

Diffusion of Sewage in Salt Water. Experiments in laboratory and in New York harbor. 2 ills., 1,500 words. Municipal Journal, January 18. 10 cts.

**Imhoff.**

Harrisonburg Imhoff Tanks. Details of design of concrete structures for sewage purification works. By William G. Myers, City Engineer. 2 ills., 400 words. Engineering News, January 25. 15 cts.

**Sewers.**

Ideal Sanitary Sewer Construction. By Frederick C. Davis. Pacific Municipalities. 2 ills., 1,500 words. January. 25 cts.

The Mill Creek Sewer. Describes the tunnel construction on this job. 6 ills., 5,000 words. By E. J. Rossback. Municipal Engineering, January. 25 cts.

Construction Methods on the Mill Creek Sewer Tunnel in St. Louis. Details of handling and quicksand. Pneumatic placing of concrete lining. By S. E. Bates. 8 ills., 2,500 words. The Contractor, January 1. 20 cts.

Construction Methods on the Mill Creek Sewer Tunnel. Continued from January 1 issue. By Stanley E. Bates. 3 ills., 1,500 words. The Contractor, January 15. 20 cts.

Replacing a New York Sewer. Open trench work constructed by cableway and ground water flow intercepted by secondary sheet piling. Oxyacetylene welding for cross-over pipe. 6 ills., 3,500 words. Contracting, January. 10 cts.

**Treatment.**

Cost of Operating Fitchburg Sewage Disposal Plant. 600 words. Municipal Journal, Jan. 11. 10 cts.

Rochester's Sewage Treatment Plant. 25,000,000-gallon plant about ready for operation. Imhoff tanks are used without filters and power is derived from the effluent before its discharge into Lake Ontario. 2 ills., 2,750 words. Municipal Journal, January 25. 10 cts.

**Trade Waste.**

Sterilization of Tannery Waste. 1,000 words. Engineering and Contracting, January 10. 10 cts.

## WATER SUPPLY.

**Air Lift.**

Pumping with the Air Lift. Theory of operation, development of the apparatus, details and use. Some general principles. Double pumping by use of a booster. By J. F. Springer. 10 ills., 3,000 words. Municipal Journal, Jan. 4. 10 cts.

**Consumption.**

Water Consumption Data. Elements of inaccuracy in the figures from many cities. Analysis of water consumption in 72 cities. Unaccounted for water. 4,250 words. Municipal Journal, Jan. 18. 10 cts.

**General.**

River Gauging by the Small Price Electric Current Meter. The second of a series of articles by G. B. Kershaw. 3,000 words. Water and Water Engineering, Dec. 15. 40 cts.

The Nature of Color in Water. From a paper by Thorndyke Saville. 2,000 words. Engineering and Contracting, January 10. 10 cts.

Progress of Excavation on the Winnipeg Aqueduct. A statement of the drag line work in the construction of the aqueduct. 10 machines are in operation. 18 ills., 1,500 words. Excavating Engineer, January. 10 cts.

Adding 11 Feet to Top of Dam at Bridgeport, Conn. Concrete dam 49 feet high raised to 60 feet and lengthened from 835 to 1,090 feet by adding mass concrete on top and supplying buttresses. By C. A. Hirschberg. 7 ills., 1,800 words. Engineering News, January 11. 5 cts.

**Mains.**

Planning Water Supply Mains. Calculation of sizes and times for laying two or three mains at intervals so as to make total cost a minimum. 2,250 words. Municipal Journal, January 25. 10 cts.

The Corrosion of Water Mains. Various formations and chemical actions which are active in destroying mains. By Wm. Ransom. 2,000 words. Water and Gas Review, November. 20 cts.

Deflection Tests of Universal Pipe. Recently made by the National Board of Fire Underwriters. 2 ills., 2,000 words. Engineering and Contracting, January 10. 10 cts.

To Compute Stress in Spiral Riveted Steel Pipe. Theoretical analysis for normal stresses. Diagram shows variation with angle of spiral. By Arthur Jobson. 1 ill., 1,000 words. Engineering Record, January 27. 15 cts.

**Meters.**

Notes on the Use of Water Meters in Winnipeg, Canada. By Thos. H. Hooper, Supt. 750 words. Water and Gas Review, November. 20 cts.

Continuous Meter Reading Plan Eliminates Peaks in Rochester Company's Bookkeeping Department. 1,500 words. American Gas Engineering Journal, January 1. 10 cts.

**Reservoir.**

The Cross Hill Covered Service Reservoir for the Birken Head Waterworks. By W. J. E. Binnie. 7 ills., 7,000 words. The Surveyor, December 15. 40 cts.

**Treatment.**

Five Waterworks Make Filter Alum. The first of two articles. This one describes the Hoover process of manufacturing alum and contains subsidiary articles as follows: Evolution and Status of the Process; Old and New Plants at Columbus, O., by Chas. P. Hoover; Low Cost Plant at Trenton, N. J., by E. W. Daggett; Simple Plant at Springfield, Mass., by E. E. Lochridge. 3 ills., 2,900 words. Engineering News, Jan. 4. 15 cts.

Five Waterworks Make Filter Alum. This installment describes the installation at Omaha. Four other installations were described in the Jan. 4th issue. By G. T. Prince. 3 ills., 3,300 words. Engineering News, Jan. 11. 15 cts.

Water Purification in America. Discusses the growth of purification and its effect on the death rate due to water-borne diseases. 3,000 words. Engineering and Contracting, Jan. 10. 10 cts.

Popularizing Purification Plants. How Grand Rapids dispels popular prejudice against the use of chemicals in water purification plant by the use of models and charts. By Chester W. Shafer. 4 ills., 1,500 words. Municipal Journal, January 11. 10 cts.

Hypochlorite Sterilization of London Water. As a money saving scheme, the water supply of London will be sent

direct to filter beds and purified without storing in reservoirs as was done previously. By Dr. A. C. Houston. 9,000 words. The Contractor, December 8. 40 cts.

Proportional Feeding Device for Water Purification Plant. 2 ills., 1,800 words. Engineering and Contracting, January 10. 10 cts.

**Tunnels.**

Cleveland's New Water Intake Tunnel Completed. Details of 3-mile tunnel under Lake Erie. Special methods in concrete block lining and in clay excavation. 10 ills., 4,800 words. Engineering News, January 18. 15 cts.

**Water Supply.**

Water Supply from a Sometimes Dry Stream. Reservoir impounds flow during 7 or 8 months to furnish supply during remainder of the year. Trench excavation by machine, dam construction and rapid pipe laying. By J. P. Wells. 1 ill., 1,500 words. Municipal Journal, January 18. 10 cts.

Water Supply and Sanitation in India. Abstract of official report on sanitary measures. Discusses sanitary works in various provinces. Water and Water Engineering, December 15. 40 cts.

Scoring Water Supply Quality. Method of ranking water supplies of cities. By Theodore Horton and E. Sherman Chase. 2 ills., 1,200 words. Engineering News, January 25. 15 cts.

## STREET LIGHTING AND POWER.

Hand-Firing Soft Coal. A presentation of the best methods of building and maintaining a soft coal fire in a hand-fired furnace. By C. H. Bromley. 9 ills., 2,500 words. Power, January 9. 5 cts.

Tendencies of Electrical Development in 1916. Progress made in the art; effects of higher material and labor cost; phenomenal output of apparatus and future outlook. 7,500 words. Electrical World, January 13. 10 cts.

Data on the Methods and Cost of Running Gas Services. From a paper by D. E. Keppelman. 2,500 words. Gas Age, January 15. 20 cts.

**Street Lighting.**

Group Street Lighting System for the City of Chicago. This article describes a system of group street lighting that is now used for large installations and has proved very satisfactory and economical in installation and operation. By W. G. Keith, Comr. of Gas and Electricity. 6 ills., 2,000 words. General Electric Review, February. 20 cts.

The New Elkhart, Ind. Street Lighting System. Conduit system to serve the needs for commercial distribution in business district. A feature in connection with the installation of new single lamp standard. 5 ills., 1,800 words. Electrical Review, January 13. 10 cts.

Phantom Circuit System for Controlling Street Lights. An outline of the operation and a detailed description of a very ingenious equipment for controlling street lights that are tapped from house lighting circuits. By A. H. Davis. 5 ills., 1,200 words. General Electric Review, February. 20 cts.

## FIRE AND POLICE.

The Operation of High Pressure Fire Systems. Data on the operation in New York, Philadelphia, Cleveland and Baltimore. 4,000 words. Engineering and Contracting, January. 10 cts.

Comparative Costs of European and American Police. Gives salaries and costs to the cities for police protection. By LeGrand Powers. 1,500 words. National Municipal Review, January. \$1.25.

## STREET CLEANING AND REFUSE DISPOSAL.

**Refuse Disposal.**

Notes on Eastville Refuse Destructor, Bristol, England. By A. H. Claypoole. 7 ills., 1,500 words. Journal of Municipal and County Engineers, January. 50 cts.

Refuse Disposal in California. Dumping garbage and rubbish in Oakland. Preventing fly and other nuisances. Discussion on incineration. 1,200 words. Municipal Journal, January 25. 10 cts.

Dutch Oven Garbage Incinerator. Describes a 20-ton Dutch oven type incinerator in Mason City, Ia. By Robt. F. Gayton. 2 ills., 1,200 words. Engineering News, January 4. 15 cts.

Professor Whipple Reports on New York's Proposed Garbage Reduction Work. Predicts that plant with a daily capacity of 2,000 tons will be a nuisance at times. 2,400 words. Engineering Record, January 13. 15 cts.

Garbage Disposal in Los Angeles. Operation of the plant during the past year. 750 words. Municipal Journal, January 11. 10 cts.

**Street Cleaning.**

New Hose Equipment for Hand Flushing in New York City. Equipment, handling and general principles of hand flushing. 1,500 words. Engineering and Contracting, January 3. 10 cts.

## GOVERNMENT AND FINANCE.

Public Utilities and City Finances. By John F. Ford. 3,000 words. Pacific Municipalities, January. 25 cts.

The Problem of Additional Sources of City Revenue. By Fred W. Powell. 2,600 words. American City, January. 50 cts.

Problems in Rate Regulation Accentuated by Higher Operating Cost. By Halford Erickson. 7,000 words. Electrical World, January 6. 10 cts.

Valuation Report of A. S. C. E. In 230 page report committee revises depreciation section to differentiate between classes of utility. All real land costs should be allowed, but no "higher use" value. 6,000 words. Engineering Record, January 13. 15 cts.

Some Advanced Municipal Steps. Annual address of the President of the National Municipal League. By Lawson Purdy. 3,500 words. National Municipal Review, January. \$1.25.

The Evolution of Types of City Government in the U. S. From a paper by Howard L. McBain. 10,000 words. National Municipal Review, January. \$1.25.

The Police Power and Its Application to Districting and Excess Condemnation. By Frank D. Stringham, City Attorney of Berkeley. 3,500 words. Pacific Municipalities, January. 25 cts.

Public Regulation of Wages, Hours and Conditions of Labor of the Employees of Public Service Corporations. Report of Committee on Franchises of National Municipal League. 6,000 words. National Municipal Review, January. \$1.25.

The Area of Projection as a Basis for the Taxation of Billboards. By Bernice V. Brown. 1,500 words. National Municipal Review, January. \$1.25.

Billboard Regulation vs. Billboard Prohibition. Lists ordinances and enactments having the effect of prohibiting billboards and claims them to be unconstitutional. By John T. Williams. 1,500 words. Pacific Municipalities, January. 25 cts.

Time Checks for Paying Men. Describes the method of paying men daily and at the same time simplifying the keeping of charges against them. A method well adapted for men living in the camp. 2 ills., 1,000 words. The Contractor, January 1. 20 cts.

## CITY PLANNING.

Legal Obstacles to Street Widening and City Planning. By C. K. Mohler. 2 ills., 1,200 words. Engineering News, January 25. 15 cts.

Fundamental Considerations in Making Proper Street Plans. 3,000 words. Engineering and Contracting, January 3. 10 cts.

How Not to Plan Cities. From a paper by J. Horace McFarland. 5,000 words. National Municipal Review, January. \$1.25.

Set Back Lines. Set back lines are recommended by Board of Estimate and Apportionment of New York City. Advantages to property owners and city. 3 ills., 1,500 words. Municipal Journal, January 11. 10 cts.

Housing and Town Planning After the War. By Harrison Barrow. Discusses compulsory town planning, road widening, arterial roads and building lines. 4,000 words. The Surveyor, December 29. 40 cts.

The Town Planning of Greater London After the War. Consideration is given to the ways and means by which the advantages of better planning may be secured. The Surveyor, January 5. 40 cts.

Making a Town Survey. Description of work in Montclair, N. J. Advantages of having a precise survey of a town or city. Party employed in making survey, instrument work, setting monu-



ments, plotting final maps and cost. By E. S. Closson, Town Engr. 2 ills., 2,500 words. Municipal Journal, January 4. 10 cts.

### MOTOR VEHICLES.

American Motor Truck Makers' Plans and Products for 1917. New models and prices and changes in construction. Commercial Vehicles, January 1 and 15. 20 cts. each.

Factors Controlling Maximum Overall Dimensions of Motor Trucks. Physical factors and legal factors are considered and average dimensions given for various sizes. 4,000 words. Engineering and Contracting, January 17. 10 cts.

What Motor Trucks Offer to Contractors. Specialized gasoline machines have been developed for a wide variety of purposes. Electric trucks need investigation. By A. J. Slade. 6 ills., 2,000 words. Engineering Record, January 6. 15 cts.

Adapting Motor Trucks to Desert Work. By Edwin H. Warner. 800 words. Engineering News, January 25. 15 cts.

Efficiency in Motor Truck Hauling. Explains how motor trucks of proper capacities may solve the problems of delivery and shipment. By Rollin W. Hutchinson, Jr. 17 ills., 5,000 words. Engineering Magazine, January. 25 cts.

The Motor Truck and the Road. Vehicle and highway must be considered as one problem. Indications are that 6-ton load carrying capacity will be the general maximum. By Nelson P. Lewis. 2,500 words. Engineering Record, January 6. 15 cts.

Adapting the Motor Truck to Its Work. Discusses maintenance of the motor truck. By C. B. Montgomery. 1,000 words. Engineering News, January 11. 15 cts.

How to Stimulate Electric-Truck Sales. Some valuable suggestions for a movement to attract attention to the electric commercial vehicle. By J. H. McDowell. 1,800 words. Electrical Review, January 20. 10 cts.

### BRIDGES AND DAMS.

Rebuilding the Susquehanna River Bridge at Harrisburg. A large structure built in longitudinal halves, steel truss arch center shifted longitudinally and transversely and supported on brackets set into piers. 2 ills., 2,000 words. Contracting, January. 20 cts.

Sciotoville Bridge Erection Is Well Started. Progress on longest continuous span in the world. 7 ills., 1,300 words. Engineering News, January 4. 15 cts.

Method of Erecting Large Concrete Arch Bridge Without False Work. 3 ills., 800 words. Engineering and Contracting, January 24. 10 cts.

Lead Expansion Joints in Floor of Concrete Arch Bridge. Details of design of 5-span concrete arch bridge in Kansas City, Mo. 4 ills., 1,000 words. Engineering Record, January 20. 15 cts.

Reinforced Concrete Successful for Railroad Culverts. Costs less than cast iron and is more durable. Reinforcement and joints. By Jos. S. Lambie. 4 ills., 1,100 words. Engineering Record, January 27. 15 cts.

The Austin, Texas, Dam. A description of the design and construction of this dam and shows the points of excellence in the design and some of the practical details of construction. By Frank S. Taylor. 3 ills., 4,500 words. Municipal Engineering, January. 25 cts.

### STRUCTURAL MATERIALS.

Stone Production of the U. S. Report of the U. S. Geological Survey for 1915. 2,500 words. Stone, January. 15 cts.

Design Features for Concrete and Reinforced Concrete Construction. From a report of the committee on concrete and reinforced concrete of the A. S. C. E. 4,000 words. Engineering and Contracting, January 24. 10 cts.

Apparatus for Testing Concrete Pipe. Home made apparatus for testing strength and deflection under load of reinforced concrete pipe in West Allis, Wis. By E. G. Orbert, City Engr. 5 ills., 1,500 words. Municipal Journal, January 11. 10 cts.

Testing Reinforced Concrete Pipe at Boulder. Systematic testing adopted after failure of untested, poorly made pipe in the trench. Specifications relative to tests, machinery and methods, results and cost. By G. R. Joslyn, City Engr. 3 ills., 2,500 words. Municipal Journal, January 11. 10 cts.

### MISCELLANEOUS.

New Electric Rolling Stock for 1916. The record of new cars ordered or built by railway companies shows a total of about 3,900. This is a marked increase over 1915 and 1914. Electric Railway Statistics. Track built in 1916. 5 pages. Electric Railway Journal, January 6. 10 cts.

Choosing Employees by Test. Some of the tests employed in rating the physical aptitude of workers. Strength, speed and control of arm, hand and fingers are important characteristics. By W. F. Kemble. 5 ills., 10,000 words. Engineering Magazine, January. 25 cts.

Concrete Paving for Small Levee on the Wabash River. Costs and methods of placing 3-inch concrete facing on earth levee. By G. C. Graeter. 3 ills., 1,400 words. Engineering News, January 4. 15 cts.

Pile Driving and the Supporting Power of Piles. Considers weight of hammer and the factors which bear upon the sustaining power of the pile. By Henry Adams. 1 ills., 5,000 words. The Surveyor, December 29. 40 cts.

Flow of Air Through Orifices Against Back Pressure. Results of an attempt to find an empirical formula. By B. S. Nelson. 4 ills., 1,600 words. Engineering News, January 4. 15 cts.

Modern Blasting Practice. Discusses recent tendencies and best practices. 10,000 words. Stone, January. 15 cts.

Municipal Consulting Engineers' Fees. By O. J. Godfrey. 1,000 words. Western Municipal News, January. 10 cts.

Operating a Steel Sharpening Shop. Methods of sharpening steel drills. By J. E. O'Rourke. 4 ills., 1,300 words. Engineering News, January 18. 15 cts.

Grubbing out Hickory Roots with a Steam Shovel. Experiences on a railroad relocation job. By Stanley E. Bates. 5 ills., 1,000 words. The Contractor, January 1. 20 cts.

Methods and Cost of Maintaining 30 Acres of Park and Boulevards. By H. R. Ferris, Victoria, B. C. 2 ills., 1,500 words. Engineering and Contracting, January 3. 10 cts.

The Public Schools as Municipal Neighborhood Recreation Centers. By H. O. Berg. 8 ills., 3,000 words. American City, January. 50 cts.

The Amphitheatre, Theatre and Stadium, Ancient and Modern. Describes ancient and modern structures as regards costs and seating capacity. By Thomas C. Atwood. 9 ills., 2,500 words. American City, January. 50 cts.

Concrete Contractor Can Use Labor Saving Plant to Cut Cost. Uncertain labor conditions make it profitable to use machinery costing 35c. to 42c. per cubic yard to erect and dismantle. By W. P. Anderson. 2 ills., 1,200 words. Engineering Record, January 27. 15 cts.

Rental Rates for Contractors. Usual prices charged for equipment. 500 words. Engineering and Contracting, January 17. 10 cts.

Some Engineering Failures and Their Causes. Editorial discussion. 1,500 words. Water and Water Engineering. December 15. 40 cts.

Types of Bank Protection on Sacramento River Compared. Costs given for various methods. No scheme wholly satisfactory but brush mattress is preferred. By N. A. Bowers. 8 ills., 4,000 words. Engineering Record, Jan. 27. 15 cts.

Precise Leveling. Conclusions of Coast and Geodetic Survey as to the effect of time of day, surface slope, wind and other conditions on the accuracy of the work. 1,250 words. Municipal Journal, Jan. 25. 10 cts.

### BOOK REVIEW.

PRELIMINAIRES D'ART CIVIQUE. By Louis van der Swaelmen. 300 pages, frontispiece and 9 diagrams. A. W. Sijthoff's Uitgevers-Maatschappij, Leiden, Holland (Brentano's, Fifth Ave. and 27th St., New York City). Price, \$2.00 net.

The after-war problem of Belgium (as of the other ravaged territories) will be more than one of re-building the dwelling and working places of the people and the restoration of old monuments—it will be a problem of city planning on such a tremendous and hitherto unapproached scale as to become nation-planning. The restoration of the great old churches is the least important phase of the problem. The one overwhelming task is the construction of new cities and villages and countrysides on the most modern, scientific, aesthetic and efficient plans that can be developed—so that all the knowledge and skill that has grown through the centuries since Belgium was first built shall not have been striven for in vain. This has been real-

ized and already the Comités Internationaux d'Art Civique "Pour la Belgique" is cooperating with the Comité Néerland-Belge d'Art Civique and l'Union Internationale des Villes to make the reconstruction of Belgium the best that the city planners of the world can give. The international committees include those of Switzerland, France, England, Netherlands, Italy and the United States. In this country the work is represented by a committee of the American Society of Landscape Architects consisting of James Sturgis Pray, Frederick Law Olmsted and Charles Mulford Robinson.

M. van der Swaelmen's book takes up this work in an interesting treatment of fundamental principles of city planning, using Belgium as a "clinical case," and he makes an eloquent plea for right planning. The city is considered as a living, collective organism, and its planning and building is treated from the viewpoints of growth and efficient functioning. The city of Amsterdam, Holland, is used as an excellent example of development which follows very closely the theoretical considera-

tions. The subjects discussed include the geographical location of cities, topography, adaptation to contours, types of plans, civic and functional centers, classification and design of streets, public buildings and open spaces.

The second part of the volume deals with the rural and national problems and questions of organization for the work of rebuilding. An appendix outlines in detail the "Civic Development Survey" methods of the English city planner, H. V. Lanchester. Another appendix describes in detail the program of a proposed encyclopedia of cities and civic art begun by the Comité Néerland-Belge d'Art Civique à La Haye.

If the encyclopedia, as planned, is achieved the result will certainly be monumental. If such a work can be effectively circulated throughout the world the science and art of city planning and administration should receive lasting benefit.

The volume is excellently printed in European style and is well-bound in paper. The cover and frontispiece, by the author, are very inspiring.

## NEWS OF THE SOCIETIES

### Calendar of Meetings.

**Feb. 5-9.**—AMERICAN ROAD BUILDERS' ASSOCIATION. Seventh American Good Roads Congress and Eighth National Good Roads Show, Mechanics Hall, Boston, Mass. Secretary, E. L. Powers, 150 Nassau street, New York.

**Feb. 7-9.**—AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS. Midwinter convention, New York City. Secretary, F. J. Hutchinson, 33 West 39th St., New York City.

**Feb. 7-9.**—MINNESOTA SURVEYORS' AND ENGINEERS' SOCIETY. Annual meeting, Minneapolis, Minn.

**Feb. 7-15.**—TENTH CHICAGO CEMENT SHOW, Coliseum, Chicago, Ill. Secretary, Blaine S. Smith, 210 South La Salle Street, Chicago.

**Feb. 8-10.**—AMERICAN ASSOCIATION OF ENGINEERS. National convention, Hotel La Salle, Chicago, Ill. Headquarters, 29 La Salle Street, Chicago.

**Feb. 8-10.**—AMERICAN CONCRETE INSTITUTE, Hotel La Salle, Chicago, Ill. Secretary, Harold D. Hynds, 1418 Walnut Street, Philadelphia, Pa.

**Feb. 9.**—TEXAS TOWN AND CITY PLANNING ASSOCIATION. Semi-annual convention, Sherman, Tex. Secretary, J. E. Suratt, Secretary Chamber of Commerce, Sherman.

**Feb. 12-14.**—AMERICAN CONCRETE PIPE ASSOCIATION. Annual convention, Chicago, Ill. Secretary, E. S. Hanson, 538 South Clark Street, Chicago, Ill.

**Feb. 15-16.**—WISCONSIN ENGINEERING SOCIETY. Annual meeting, Madison, Wis. Secretary, L. S. Smith, 939 University Ave., Madison.

**Feb. 19-24.**—SOUTHWESTERN CONCRETE ASSOCIATION. Annual meeting and concrete show, Convention Hall, Kansas City, Mo. Chairman, Show Committee, Chas. A. Stevenson, 1433 West 10th Street, Kansas City, Mo.

**April 17-19.**—TRI-STATE WATER AND LIGHT ASSOCIATION OF THE CAROLINAS AND GEORGIA. Seventh annual convention, Macon, Ga. Secretary-treasurer, W. F. Stieglitz, Columbia, S. C.

**April 18-22.**—NATIONAL CONFERENCE ON COMMUNITY CENTERS. Annual conference, Chicago, Ill. Secretary, John Collier, 70 Fifth Ave., New York.

**May 8-10.**—NATIONAL FIRE PROTECTION ASSOCIATION. Annual meeting, Washington, D. C. Secretary-treasurer, Franklin H. Wentworth, 87 Milk Street, Boston, Mass.

**June 11.**—NEW YORK STATE CONFERENCE OF MAYORS AND OTHER CITY OFFICIALS. Annual conference, Buffalo, N. Y. Secretary, W. P. Capes, 25 Washington Ave., Albany, N. Y.

**Nov. 12-16.**—AMERICAN SOCIETY OF MUNICIPAL IMPROVEMENTS. Annual convention, New Orleans, La. Secretary, Charles C. Brown, 469 Transportation Building, Chicago, Ill.

### American Association of Engineers.

The midwinter convention of the Association is being held at Chicago (February 8-10). The program of the meeting is as follows:

Thursday, February 8, 10 a. m.—Opening of convention, Garrison Babcock, national president. Appointment of committees. Addresses: Accountancy and The Engineer, Hodgson Jolly; Proposed Plan for National Promotion, A. H. Krom; Engineers as City Managers, Robert L. Fitzgerald, City Manager, Winnetka, Ill.

Afternoon Session, 2 p. m.—Visit

Cement Show in a body, courtesy of Blaine S. Smith, general sales manager of the Universal Portland Cement Co.

Evening Session, 8 p. m.—Attend Engineering Session of American Concrete Institute in a body.

Friday, February 9, 10 a. m.—Inspection trip, Municipal Pier, Field Museum, Lake View Pumping Station and other points of interest in Chicago. Courtesy of John Ericson, City Engineer, Chicago, Ill.

Afternoon Session, 1 p. m.—Inspection trip to Buffington Works of Universal Portland Cement Company, under direction of W. S. Anderson, assistant division engineer, Promotion Bureau.

Evening Session, 8 p. m.—Informal smoker, C. C. Saner, secretary Chicago Chapter, in charge. Subject for discussion: National Employment, paper furnished by C. A. Morse, chief engineer, Rock Island Lines.

Saturday, February 10.—Responsibility of Members, W. S. Anderson; Civil Service and The Engineer, Garrison Babcock, consulting engineer. Discussion by William B. Hale, president of the Civil Service Reform Association of Chicago.

The Problem of Qualifications, N. M. Stineman, office engineer C. M. & St. P. R. R. Discussion by Edwin R. Webster, division engineer, C. M. & St. P. R. R., Marion, Ia.

Afternoon Session, 1:30 p. m.—Engineering Ethics, F. H. Newell, professor of Civil Engineering, University of Illinois. Discussion by J. C. Holland, vice-president of Chicago Chapter, and Paul P. Stewart, Ketler Elliott Erection Co., Chicago. Business Side of Engineering, E. J. Mehren, editor Engineering Record. Standardization of Engineering Education, Ray C. Yoe-man, dean of engineering, Valparaiso University. For the Good of the Association, Arthur Kneisel, national secretary.

Evening Session, 6:30 p. m.

### American Concrete Pipe Association.

The annual convention of this society will be held in the Auditorium Hotel, Chicago, February 12, 13 and 14.

At the Monday sessions, papers will be presented as follows: "Some Things I have seen in the Field," by H. A. La Roy; "Sales Methods," by George Scofield; "Selling Pipe Through Dealers," by W. A. Goodman.

Tuesday's papers will include: "New Drain Tile Specifications of the American Society for Testing Materials," by George P. Diekmann; "Finding the Leaks, or The Crime of Profit and Loss," by C. M. Wood; "Supporting Strength of Drain Tile in Ditches," by W. J. Schlick; "Developing Farm Trade," by A. J. R. Curtis; "What Wisconsin Farmers Want to Know About Cement Tile," by E. R. Jones.

Final sessions will be held Wednesday

day and papers will be presented as follows: "Concrete for Sanitary Sewers," by M. W. Loring; "Aggregates for Sewer Pipe and Drain Tile," by Prof. D. A. Abrams; "Some Experiences in Promoting Concrete Sewer Pipe," by W. A. Curless; "Big Tile on Some Indiana Drainage Ditches," by C. D. Kinsman; "Advertising for Pipe Manufacturers," by L. S. Bruner; "Culvert Pipe in the South," by N. T. Shearman.

### International Association of Fire Engineers.

A meeting of the Board of Directors of this association will be held in Jacksonville, Fla., February 15, at which plans will be made for the annual meeting, which will be held in October.

### American Institute of Electrical Engineers.

The fifth mid-winter convention of the American Institute of Electrical Engineers will be held in New York City, Feb. 14, 15 and 16. Headquarters will be at the Engineering Societies Building, 33 West 39th street, and the program as planned calls for a number of inspection trips, as well as many interesting papers.

### New England Water Works Association.

The February meeting of this association will be held at Hotel Brunswick, Copley Square, Boston, Wednesday, Feb. 14, 1917. The program follows:

11 a. m.—Meeting of the executive committee at the headquarters, Tremont Temple. Lunch will be served at one o'clock.

2 p. m.—"The Providence Water Supply," illustrated, by Frank Winsor, chief engineer, water supply board, city of Providence, R. I.; "Forestry in Relation to Public Water Supplies," by Prof. J. W. Toumey, director, School of Forestry, Yale College, New Haven, Conn. Discussion.

### Daylight Saving Conference.

A national daylight saving convention was held at New York, January 30 and 31, to consider the proposition to turn the clocks of the United States one hour forward after midnight on the last Sunday of April, and turn them back after midnight on the last Sunday of September.

Delegates from all over the country were present, including ten from the American Railway Association, which fixes the time zones for train schedules. Among the organizations supporting the movement are the New York daylight saving committee, under whose auspices the convention was held; the chambers of commerce of Chicago, Boston, Cleveland, Rochester and Pittsburgh, the Merchants' Association of New York, and the More Daylight Club of Detroit.

"The results anticipated and already experienced abroad," Marcus M. Marks, president of the borough of Manhattan, and chairman of the New York



daylight saving committee, told the convention, "are economy through reduction of lighting bills, saving eyesight through the use of less artificial light and more daylight, and health building through working one hour more in the cooler morning and one hour less in the hot summer's afternoon. An extra daylight hour is thus added for recreation."

Mr. Marks suggested the organization of a national daylight saving committee, with officers and members representing each part of the country, its purpose to be the general education of the public in daylight saving, and the enactment of legislation to make it nation-wide.

Chambers of commerce and boards

of trade in virtually every large city in North America have given the subject careful study, according to Robert Garland, president of the Pittsburg Chamber of Commerce and chairman of the special committee on daylight saving of the Chamber of Commerce of the United States. He said that at a meeting of the committee in Pittsburg last December an exhaustive survey was prepared, and that a report will be made at the annual meeting of the national chamber in Washington next Thursday.

Robert Brunet told the convention that, based on facts and figures he had collected, the daylight saving plan will conserve to the citizens of the United States about \$40,000,000 a year, with

advancing increments as needs and numbers increase. Referring to the argument that the plan is a form of self-deception and that its advocates are "not in an altogether healthy state of mind," Mr. Brunet said:

"People are deceived every time they see a clock or watch, for sun time does  
(Continued on page 219.)

## PERSONALS

Carter, E. Kemper, has resigned as city engineer and superintendent of waterworks of Liberty, Mo., to accept employment with the Standard Asphalt & Rubber Co., Chicago, Ill. Mr. Carter will retain his residence and headquarters in Liberty and will serve for the time being as consulting engineer for the city. In his new position he will act as representative of the company in the middle west, including Missouri, Kansas, Iowa, Nebraska and Oklahoma. Mr. Carter came to Liberty four years ago from St. Louis, where he had been with the Southwestern Bell Telegraph & Telephone System and previous to that he had served as assistant city engineer and deputy county engineer at St. Joseph, Mo. Mr. Carter is a C. E. graduate of the University of Missouri and an associate member A. S. C. E.

Crocker, H. S., has been elected city engineer of Brockton, Mass.

Isaacson, J. J., has been appointed superintendent of playgrounds of Omaha, Neb.

Lamoraux, S. A., has resigned as superintendent of streets of Schenectady, N. Y.

Metz, William, has resigned as fire chief of Walla Walla, Wash.

Stott, Henry Gordon, motive power superintendent of the Interborough Rapid Transit Company and since 1904 in charge of the entire system, including the subway, elevated and surface lines, died Jan. 15 at his home in New Rochelle, in his 52d year. He was born in the Orkney Islands, Scotland, and was graduated in 1885 from the College of Arts and Sciences in Edinburgh.

After extensive engineering experience in England Mr. Stott came to New York in 1891 and installed an underground conduit and cable system for the Buffalo Light & Power Co. Following this he was appointed engineer of the company, and during 1901 came here as superintendent of motive power for the Manhattan Railway Company. In 1904 he constructed the 59th street power plant, and since then had managed the entire system, one of the greatest of its kind in the world.

Mr. Stott was a member of the council of the American Institute of Electrical Engineers, of which he was president during 1907-08, and belonged to the American Society of Civil Engineers, the New York Electrical Society and the Engineers' Club.

Tucker, William R., has been appointed chief of police of Beverly, Mass.

Taft, Thomas J., has been appointed chief of police of New Bedford, Mass.

## PROBLEMS CITIES ARE STUDYING WITH EXPERTS

Emmons, Minn., is to construct a LIGHT PLANT. Plans are to be prepared by E. D. Jackson, Capital Bank Building, St. Paul, Minn.

Casa Grande, Ariz., is to construct an ELECTRIC LIGHT PLANT and WATERWORKS to cost about \$30,000. V. A. Thompson, Phoenix, Ariz., is the engineer for the work.

The ELECTRIC LIGHT PLANT of Benson, Minn., is to be improved from plans to be prepared by W. E. Skinner, 714 Plymouth Building, Minneapolis, Minn.

A FILTER PLANT, to cost about \$30,000, is to be constructed by Portage, Wis., L. P. Wolf, 1000 Germania Building, St. Paul, Minn., having completed the plans for the work.

In installing new equipment for its POWER PLANT, Algona, Ia., had the consulting engineering services of W. C. Buck, 4821 Fremont avenue S., Minneapolis, Minn.

A SEWERAGE SYSTEM and DISPOSAL PLANT to cost between \$300,000 and \$400,000 is planned for Easton, Pa. The consulting engineers for the work are Hill and Ferguson, 100 William street, New York, N. Y.

An ELECTRIC DISTRIBUTION SYSTEM and transmission line is to be constructed by Mullenville, Kans. The engineers for the work are W. B. Rollins & Co., 209 Railway Exchange Building, Kansas City, Mo.

La Grange, La., is to install an ELECTRIC STREET LIGHTING SYSTEM. The consulting electrical engineer is B. O. Austin, and the consulting city engineers are Anderson, Christie of Charlotte, La.

The selectmen of the town of Milford, Mass., have been investigating the condition of the local water company in order to present a case for lower RATES to the state utilities commission. William Plattner, North Attleboro, Mass., was the expert employed to make the investigation.

Sherburne, N. Y., is to improve its auxiliary FIRE PROTECTION water supply. Charles E. Perry, 36 State street, Albany, N. Y., is preparing plans and specifications for the necessary equipment.

Humboldt, Kans., is to extend its SEWER SYSTEM, plans for the work having been prepared by Black & Veatch, Interstate building, Kansas City, Mo.

Covington, Ky., is considering the installation of a municipal ELECTRIC LIGHT PLANT. George Horning, consulting engineer, Woolsack Building, Newport, Ky., is to prepare plans for the work.

West Jefferson, O., is considering the construction of WATERWORKS to cost about \$20,000. Plans were the work of the Richards Engineering Co., 37½ E. Long street, Columbus, O.

New Cambria, Mo., is soon to vote on the question of improving the LIGHT PLANT. Preliminary estimates have been made by E. B. Murray, 920 Walnut street, Kansas City, Mo.

The town of Mansfield, Mass., is considering the construction of a SEWERAGE SYSTEM. Frank A. Barbour, 73 Tremont street, Boston, Mass., is to revise plans made eight years ago for a similar project.

The questions of RATES, electrolysis, leakage, etc., in connection with the municipal GAS distribution system are being taken up by the officials of Hamilton, O. The expert appointed to make the investigation, S. S. Wyer, Columbus, O., has just made his report.

Many phases of the problems of CITY PLANNING, including those of extension plans, grade crossings, food distribution, traffic regulation and other traffic and transportation questions are to be studied by Mansfield, O. Council has retained as experts Ernest P. Goodrich, 35 Nassau street, and George B. Ford, 101 Park avenue, New York City.

## INDUSTRIAL NEWS

**Cast Iron Pipe.**—Chicago—At Minneapolis, Minn., inquiry has been sent out for a maximum of 2,200 tons of pipe and at Chicago bids have been received for 300 tons of special fittings. Quotations: 4-inch, \$44.50; 6-inch and larger, \$41.50, with \$1 extra for class A. Birmingham—Leading makers admit receiving intimations that parties contemplating large transactions prefer to wait until lower prices prevail before they place orders. This has been feared for some time. Notices of delay are now coming in from communities where the bonds voted are not sufficient for the intended improvement under present prices. Production will probably be reduced in the near future. For the present prices will be maintained, as pig iron is not the only raw material used in pipe manufacture which is now dear. Quotations: 4-inch, \$39; 6-inch and upward, \$36, with \$1 added for extra lengths. San Francisco—Some small hand-to-mouth corporation buying is reported, but no municipal business has been booked lately and there is little in immediate prospect. There has been talk of selling part of the 3,000 tons of high-pressure pipe still in the San Francisco municipal yard. Prices stand as before. Quotations: \$49 for 6-inch; \$52 for 4-inch, and \$1 extra for class A. New York—New Brunswick, N. J., opened bids Feb. 6 on 194 tons of 6 and 8-inch. Many projects are under consideration and are steadily being brought into practical shape, requiring large quantities of pipe, so that important business is assured for the early future. Specifications are not ready yet on any of these matters. Municipal lettings are few and small. The price of pipe is maintained. Quotations: \$41.50 for 6-inch, class B and heavier, with class A, taking an extra of \$1 per ton.

**Lead.**—The acute scarcity of prompt and nearby lead has sent prices up. Quotations: New York, 8.15 cents; St. Louis, 8.00 cents.

**The Granite Paving Block Manufacturers' Association of the U. S.**, Boston, Mass., is represented at the American Road Builders' Convention by Mr. C. D. Pollock, the consulting engineer; Miss Lillian M. Martin, assistant secretary, and Zenas W. Carter, field secretary. The space is booth No. 88, and exhibits a square yard of improved granite block pavement with cement grouted joint using a one to one mixture; one square yard of improved granite block pavement with the asphalt and sand mastic filler and one square yard of pavement duplicating the present type of old style Boston pavement, with the blocks right from the streets using the turtle back blocks and sand joint filler. This exhibit is to show the contrast between old style granite, which is rough and uneven, and the new type of granite paving, which has smooth even surface and

properly and permanently filled joints that make it water proof. In addition there are on display sample blocks from a great number of the quarries east of the Mississippi, one table being devoted to this display. As at previous shows, there is also shown a sample taken from Main street, Worcester, Mass., which has been under traffic for fifteen years "and where the pavement is still in perfect condition or better than the day it was laid and which has stood up now for fifteen years with no cost to the city for maintenance due to wear and tear." With these blocks from Worcester is shown an affidavit signed by the mayor, Geo. M. Wright, and A. T. Rhodes, commissioner, certifying that the slabs shown are only average samples and that they now have approximately twenty-five miles of this type of pavement in the city of Worcester, on which there has been very little maintenance due to wear and tear.

**The Lakewood Engineering Company**, Cleveland, O., makes an interesting announcement of a new development in the contractors' equipment field. Hereafter the Lakewood line of contractors' equipment, the Owens-Wylie concrete chute systems and the Milwaukee and Wisconsin concrete mixers and street pavers will be sold under one sales management by the Lakewood Engineering Company. The new plan contemplates the development of an organization capable of building and marketing a really complete line of equipment, and a volume of business is anticipated to commend the services of some of the best men in the industry. The personnel of the new organization is as follows: Chas. F. Lang, president, Lakewood Engineering Co.; N. F. Teschan, president, Milwaukee Concrete Mixer Co.; Roy G. Owens, manager, Contractors' Equipment Dept.; Lloyd Brown, manager, Car Dept.; W. A. Meddick, assistant manager, Car Dept.; H. Walter Sykes, manager, Electrical Industrial Equipment; W. G. Grail, manager, Clam Shell Bucket Dept.; V. Truelson, chief engineer, Milwaukee plant; Jas. Lockhart, chief engineer, Car Dept., Cleveland; Thomas D. Maley, chief engineer, Contractors' Equipment, Cleveland, and Harry T. Pleines, general supt., Cleveland.

**The American-La France Fire Engine Company, Inc.**, Elmira, N. Y., has received the following orders:

Atlantic City, N. J., four Type 40 combination chemical engine and hose cars; Bethlehem, Pa., one Type 40 pumping engine and hose car; Clarinda, Ia., one Type 40 combination chemical engine and hose car with Junior pump; Duluth, Minn., one Type 75 pumping engine and hose car; East Orange, N. J., one Type 17 tractor and two Type 40 combination chemical engine and hose motor cars; Erie, Pa., one Type 75 pumping engine and hose car; Juneau, Alaska, one Type 12 combination chemical engine and hose car with Junior pump; London, O., one Type 40 combi-

nation chemical engine and hose car with Junior pump; Mahanoy City, Pa., two Type 10 pumping engines; Newton, Mass., one Type 75 pumping engine; Oakdale, Cal., one Type 75 pumping engine; Oskaloosa, Ala., one Type 75 pumping engine; Oyster Bay, N. Y., one service truck; Racine, Wis., one Type 40 combination chemical engine and hose car with Junior pump; Susquehanna, Pa., one Type 40 combination chemical engine and hose car with Junior pump; Ventura, Cal., one Type 12 combination chemical engine and hose car with Junior pump; Willimantic, Conn., one Type 75 pumping engine; Wichita, Kans., one Type 20 combination chemical engine and hose car with Junior pump; West Hartford, Conn., one Type 75 pumping engine; Anglesea, N. J., one Type D Brockway combination chemical engine and hose car; Bethlehem, Pa., two Type D Brockway combination chemical engine and hose car and one Type D Brockway tractor; East Lansdowne, Pa., one Type D Brockway combination chemical engine and hose car.

The following shipments have been made by the company:

Sparks, Nev., Type 40 combination chemical engine and hose car with Junior pump; Port Chester, N. Y., Type 31 tractor; Lancaster, Pa., Type 40 combination chemical engine and hose car; Dayton, O., two Type 12 triple combination chemical engine and hose motor cars; Aurora, Minn., Type 40 combination chemical engine and hose car with Junior pump; Bay City, Mich., Type 12 combination chemical engine and hose car; Dayton, O., two Type 12 triple combination pumping engine and hose cars; Moorestown, N. J., Type 40 combination chemical engine and hose car; Laurel, Del., Type 40 combination chemical engine and hose car with Junior pump; East Hartford, Conn., Type 12 pumping engine and hose car; Topeka, Kans., Type 12 combination chemical engine and hose car; Hempstead, N. Y., Type 12 pumping engine and hose car; No. Tonawanda, N. Y., Type B Brockway combination chemical engine and hose car; Lodi, N. J., Type 40 combination chemical engine and hose car; Westwood, N. J., Type 2 Brockway combination chemical engine and hose car; Jersey City, N. J., Type 31 75-foot aerial truck; Clinton, Mass., Type 12 triple combination chemical engine and hose car; Bogota, N. J., Brockway Type B combination chemical engine and hose car; Shamokin, Pa., Type 12 triple combination chemical engine and hose car; Mason City, Ia., Type 31 aerial truck.

**The Goodyear Tire & Rubber Co.**, Akron, O., announces through F. H. Sawyer, manager of the truck tire department, that "984 cities in the United States and Canada are now using Goodyear tires on their motorized apparatus. During the year that has just passed 329 new cities in these two countries bought equipment mounted on Goodyears. A careful check of the tire equipment of all the pieces of apparatus manufactured during 1916 shows that 65 per cent of them left the factories on Goodyear tires. Tires for fire apparatus have reached a degree of perfection equal to that of tires for pleasure cars. But for this improvement in tires,



motorized fire apparatus would not have attained its present high efficiency. The perfection of tires has kept pace with that of the apparatus itself."

**Mastic Mixing Machine.**—Mastic has always been prepared from cakes consisting of bitumen and dust. This cake mastic is combined at the job with sand, gravel and flux, the mixture being cooked in kettles. Under this practice it has been necessary to ship the mastic cake long distances from the point of manufacture and the pot mixing has been a slow and laborious undertaking. **The Iroquois Works, Buffalo, N. Y., of The Barber Asphalt Paving Company** have now designed and put on the market a mastic mixing machine which is described in a bulletin just issued. This machine has two heating drums in which the bitumen, dust and other mineral aggregate are combined in the mixer located at the site of the work. As all the ingredients but the asphalt are usually to be obtained locally, the machine makes it possible to handle mastic jobs much more economically, it is claimed, than in the past. It is also claimed that the machine-made mixture is more uniform than that obtained from pots.

## NEWS OF THE SOCIETIES

(Continued from page 217.)

not coincide with standard time, except in a very few places. The New York people are even slower than the Philadelphia people, for standard time here is four minutes behind sun time, while in Philadelphia it is one minute ahead."

### Nebraska League of Municipalities.

By a two to one majority the Nebraska League of Municipalities, in convention at Hastings, Jan. 25 and 26, endorsed the proposed city manager plan bill pending before the legislature, but the recommendation asking adoption was left to each municipality. The city manager plan of city government, as proposed in a pending legislative bill to be introduced by Senator Adam McMullen of Wymore and reviewed at length by C. A. Sorenson of Lincoln brought forth a lively and interesting discussion.

This important bill and others affecting Nebraska cities and towns and soon to be introduced in the legislature, was reviewed by Mr. Sorenson under the discussion, entitled "Pending Legislation Affecting Municipalities." Mr. Sorenson is counselor and assistant director of the legislative reference bureau at Lincoln and has had a hand in the formation of the proposed laws discussed. The city manager plan proposed in the McMullen bill is based on the Dayton, O., plan with certain changes which it is believed will be advantageous. One of these changes is the elimination of the recall system effective at Dayton.

The proposed city manager bill calls for a city council of five members, chosen at large, in cities of the second class whose duties are to be only those of a legislative nature. These council-

men in turn are to choose a city manager, who is really a business manager and who is to be in active control and charge of city affairs. All city employees ranging from janitors up to head of the financial department are to be chosen by the city manager on the merit system, for the lower positions, and for the higher positions, including heads of departments, the manager is to choose one of three men recommended for the place by a majority of the city council. The proposed law would give the city manager the sole power to discharge any employee at any time who failed to follow instructions or measure up to the required standards. Cities of the first class under 25,000 population would have a city council of seven members. Cities of the first class with 40,000 or more population would have eleven councilmen and metropolitan cities would have a legislative council of thirteen members, all elected at large.

The bill proposes that the city manager shall hold his office for four years and may be re-elected indefinitely. It further proposes that he may be selected from without the state, giving the council the opportunity to choose from a wide field and having a tendency to develop professional talent along the line of city managers.

Another pending legislative matter discussed by Mr. Sorenson is that one which proposes to place under the supervision of the state railway commission all public and private municipal utilities, including gas and electric light franchises. This would give the railway commission authority to act on all matters dealing with rates, service and physical valuations and would make it impossible for corporations to raise their rates without the commission's consent. The proposed constitutional convention bill, which has already unanimously passed the lower house, was reviewed by Mr. Sorenson.

The officers for the ensuing year are: Roland F. Ireland, Crete, president; Andrew P. Moran, Nebraska City, vice president, and C. A. Sorenson, Lincoln, secretary-treasurer, and the executive board members, F. M. Arbuckle, Kearney; E. J. Bredenberg, Wahoo, and Mayor William Madgett, Hastings. Fremont was chosen as the place for the next annual meeting over Kearney, Beatrice and Norfolk.

### New Jersey Mosquito Extermination Association.

The fourth annual meeting of the New Jersey Mosquito Extermination Association was held at Atlantic City, Jan. 25 and 26. Extension of the extermination plan beyond mere drainage was urged by C. C. Vermeule of East Orange, who thought that steps should be taken to make drained mosquito lands agriculturally valuable. Dr. J. G. Lipman, director of the New Jersey Experiment Station, endorsed this idea and told how more than 1,000,000 acres have been drained and made to support thousands of inhabitants, although the lands are below sea level.

The fight against the mosquito at

Princeton, where a squad of human decoys went out nightly for a whole summer and brought in specimens from twenty-seven stations, was described by Dr. Ulric Dahlgren of Princeton. Through these men bringing in every mosquito that tried to bite them the breeding places of pests were located and eliminated. More work, however, is necessary and the speaker hoped that sufficient funds would be forthcoming to continue the war until the mosquito is extinct in that district.

In addition to other surveys and detective work there was a medical survey. Every case of malaria in the community was marked on a map and the mosquitoes blamed for the prevalence of the disease were sought and attempts made to eliminate them.

Eugene Winship of the Department of Health of Greater New York told of the work in his district during sixteen years, involving the expenditure of nearly \$1,000,000. He expected that the drainage of the salt marshes in Greater New York would be completed this spring.

The malaria problem of Virginia was discussed by W. J. Schoene, state entomologist, who told of the large number of cases of that disease and of the million acres of swamp and periodically overflowed land in that state on which is placed the responsibility.

C. C. Adams of New York gave further details of the extermination work in that state. The Connecticut problem was dealt with by Dr. W. E. Britton, state entomologist. Contract work in mosquito extermination propaganda was the theme of Jesse P. Leslie of Hackensack, and publicity methods were explained by Russell W. Giles of Elizabeth. The meeting was brought to a close with a resume of what extermination means to the people, by Dr. Ralph H. Hunt of East Orange.

### Texas City Planning Association.

The annual meeting of this convention will be held at Sherman, Tex., February 9.

Ed. H. McCuiston, Mayor of Paris, will discuss city planning and J. R. Babcock of Dallas Chamber of Commerce and Manufacturers' Association will tell of the co-operation of commercial organizations in this work.

Other speakers on the program are S. A. Greeley, sanitary engineer of Chicago; Mrs. Florence C. Floore, directing the club women of Texas; Miss M. A. Moore of Denton; F. K. McGinnis, city forester of Dallas; Mrs. J. L. Young of Mineral Wells, and Charles Saville, director of the Dallas Department of Health.

### New York State Fire Chiefs' Association.

Chief T. C. Collins, of Cohoes, president of the New York State Fire Chiefs' Association, and Chief Henry R. Yates of Schenectady, secretary of the association, recently held a conference at which time they decided to hold the state convention at Watertown. The convention will be held during the first week in June.

# ADVANCE CONTRACT NEWS

## ADVANCE INFORMATION BIDS ASKED FOR

## CONTRACTS AWARDED ITEMIZED PRICES

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

### BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
<b>STREETS AND ROADS.</b>				
Mich., Lapeer	.....	Feb. 9..	Six miles gravel road.....	H. W. Davis, Chr. Co. Comra.
N. Y., L. I. City	.....	Feb. 9..	Completing abandoned grading and sidewalk contract, requiring 19,300 sq. ft. concr. walk and 930 yds. grad.....	M. E. Connelly, Boro Pres.
Wis., Milwaukee	.....	Feb. 10.30 a.m.,	Paving with asphalt and constructing curbs and sidewalks.....	F. G. Simmons, Comr. P. W.
Mich., Flint	.....	Feb. 8 p.m.,	600 tons natural asphalt, 600 tons petroleum asphalt, 150 tons fluxing oil, 800 tons limestone dust, 6,000 tons binder stone, 10,000 cu. yds. asphalt sand, 30,000 sq. yds. paving brick and 19,000 ft. expansion cushion.....	D. E. Newcombe, City Clerk
Wash., Tacoma	.....	Feb. 10..	Hydraulic fill, one mile long.....	D. H. White, Co. Engr.
Ore., Astoria	.....	Feb. 10..	44,000 sq. yds. paving on Lewis and Clark Road; cost, \$70,000.....	G. F. Parker, Co. Surv.
N. C., Asheville	.....	Feb. 10..	25,000 sq. yds. asphalt or Topeka, 4,650 sq. yds. sheet asph., 4,650 sq. yds. brick and 4,300 sq. yds. durax.....	J. H. Lee, Pur. Agt.
Ind., Liberty	.....	Feb. 10..	Constructing county line roads.....	G. W. Wray, Co. Aud.
Ky., Georgetown	.....	Feb. 12..	Improving several streets.....	City Clerk.
N. J., Camden	.....	Feb. 11 a.m.,	Constructing gravel road.....	J. J. Albertson, Co. Engr.
Ky., Irvine	.....	Feb. 12..	1.5 mile state aid road construction.....	J. A. Alexander, Co. Clerk
O., Cleveland	.....	Feb. 12..	Paving and improving streets in East View.....	Pease Engineering Co., Marshall Bldg., Cleveland.
Ill., East Dubuque	.....	Feb. 13..	1,550 sq. yds. brick pavement on bridge.....	M. Tschirgl & Sons, Engrs, Amer. Trust Bldg., Cedar Rapids, Ia.
Ky., Jamestown	.....	Feb. 13..	Co. road work, \$50,000 available.....	County Judge.
Ky., Albany	.....	Feb. 13..	Co. road work, \$40,000 available.....	Co. Commissioners.
Md., Baltimore	.....	Feb. 13..	8.40 miles concrete or bit. macadam roads.....	State Roads Commission.
O., Cincinnati	.....	Feb. 13..	30,000 gallons paving pitch delivered hot on the streets.....	Ernst Von Bargen, Pur. Agt.
Minn., St. Paul	.....	Feb. 13..	Furnishing Portland cement, creosoted wood block, concrete and other sand, stone, gravel, curbing, pitch filler and sewer pipe and brick, all in large quantities.....	H. W. Austin, Pur. Agent
N. J., Millburn	.....	Feb. 13..	Crushed stone and screens.....	Wm. Byrd, Chrm. Twp. Com.
N. J., West New York	.....	Feb. 13..	Paving with bituminous concrete.....	C. F. Henry, Town Clerk
O., Columbus	.....	Feb. 13..	Grading and paving with brick.....	G. A. Borden, Dir. of P. Serv.
Wash., Everett	.....	Feb. 13..	Constructing concrete roads.....	A. B. Dean, Chief Dep. Engr.
N. J., Trenton	.....	Feb. 13..	Furnishing and applying 65,000 gallons tar on county roads.....	County Engineer.
Ill., Chicago	.....	Feb. 14..	Constructing cement sidewalks on many streets.....	E. J. Glackin, Sec'y. Board of Local Improvements.
Md., Baltimore	.....	Feb. 14..	Oiling 469 miles of state road, requiring 1,254,499 gallons of oil.....	State Roads Commission.
Ind., Indianapolis	.....	Feb. 14..	Graveling, curbing and constructing sidewalks.....	B. J. T. Jeup, City Engr.
W. Va., Charleston	.....	Feb. 14..	3.2 miles brick or concrete road.....	F. G. Burdette, Engr., Court House.
Mich., Monroe	.....	Feb. 14..	Completing 15 miles concrete roads.....	Monroe Road Commission.
O., Columbus	.....	Feb. 14..	Constructing state highways.....	Clinton Cowen, St. Highway Comr.
Md., Baltimore	.....	Feb. 14..	Paving with asphalt, brick, wood block, granite block and relaid granite block.....	L. G. Turner, Chairman Paving Committee.
Ind., Noblesville	.....	Feb. 15..	One concrete and six gravel roads.....	W. O. Horton, Co. Aud.
Ia., Hampton	.....	Feb. 15..	90,000 sq. yds. pavement and concrete curb.....	T. S. DeLay, Engr., Creston.
Pa., Newcastle	.....	Feb. 15..	Six miles 16-foot concrete road.....	T. A. Gilkey, Engr., Mercantile Bldg.
Pa., Ruffsdales	.....	Feb. 15..	Grading and macadamizing.....	James M. Baker.
Wis., Waupun	.....	Feb. 15..	15,000 sq. yds. hard surface pavement.....	E. B. Parsons, Engr., Jefferson.
N. J., Flemington	.....	Feb. 15..	5,600 ft. road construction.....	Board of Freeholders
Ont., London	.....	Feb. 15..	Asphalt paving work, cost \$60,000.....	City Engineer.
N. Y., Buffalo	.....	Feb. 15..	Paving and repaving several streets.....	A. W. Kreinheder, Comr. P. W.
N. Y., New York	.....	Feb. 15..	Repairing asphalt pavements on Harlem River Bridges.....	F. J. H. Kracke, Comr. Plant & Structures.
Wis., Waupun	.....	Feb. 15..	Grading and paving with concrete.....	J. E. Brinkerhoff, City Clerk.
Va., Richmond	.....	Feb. 16..	Paving several alleys.....	C. E. Bolling, City Engr.
Ind., Indianapolis	.....	Feb. 16..	Paving, sewers and sidewalks.....	B. J. T. Jeup, City Engr.
Ind., Brazil	.....	Feb. 16..	Stone and gravel road.....	W. O. Graeser, Co. Aud.
Cal., San Bernardino	.....	Feb. 17..	4 1/4 miles street construction.....	L. R. Patty, Clk. Co. Supvrs.
Conn., Manchester	.....	Feb. 17..	Constructing sidewalks, curbs, etc.....	City Engineer
Conn., Hartford	.....	Feb. 17..	Concrete walks, curbs, etc., cost \$20,000.....	Board of Selectmen, South Manchester.
Wash., Everett	.....	Feb. 19..	Constructing concrete road.....	A. B. Dean, Chief Dep. Engr.
Mich., Kalamazoo	.....	Feb. 19..	14-ft. gravel road, and 2 miles of 9-ft. gravel road.....	J. J. Campbell, Co. Clk.
Ind., South Bend	.....	Feb. 19..	Constructing concrete roads.....	A. F. Wolf, Co. Aud.
W. Va., Fayetteville	.....	Feb. 19..	46 miles bit. macadam, concrete, brick or asphalt road construction, requiring 150,000 cu. yds. grading.....	R. S. Steagal.
S. Dakota, Madison	.....	Feb. 19..	Paving several streets.....	C. A. Trimmer, City Engr.
Cal., Stockton	.....	Feb. 19..	Improving three streets.....	E. D. Graham, Co. Clerk.
O., Chicago Junction	.....	Feb. 19..	Brick paving, cost \$16,000.....	E. K. McMorris, Village Clerk.
N. J., Camden	.....	Feb. 19..	Furnishing 3 five-ton motor trucks with asphalt bodies; constructing concrete sidewalk; furnishing fuel oil, cement, stone dust, crushed stone, asphalt sand and asphalt, 50 tons of each.....	L. E. Farnham, City Engr.



## BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
N. Y.	Albany	1 p.m., Feb. 19.	Constructing state highways.	Edwin Duffey, St. Highway Comr.
W. Va.	Philippi	1 p.m., Feb. 20.	18.7 miles macadam and 12 concrete bridges.	S. F. Hoffman, Co. Clerk
Mont.	Great Falls	2 p.m., Feb. 20.	Concrete walk, curbing and crossings during 1917.	City Engr.
N. Y.	Albany	1 p.m., Feb. 20.	Improving highways in several counties.	E. Duffey, State High. Comr.
O.	Columbus	Noon, Feb. 20.	Constructing sidewalks on 12 streets.	G. A. Borden, Dir. Pub. Serv.
Minn.	Granite Falls	2 p.m., Feb. 21.	10 and 20-foot blade road graders.	G. H. Wilkins, Co. Aud.
W. Va.	Parkersburg	Feb. 21.	22,000 sq. yds. brick pavement.	T. L. Higgs, City Engr.
W. Va.	Grundy	Feb. 22.	Improving streets, cost \$25,000.	City Clerk
N. Y.	Olean	8 p.m., Feb. 23.	2,960 sq. yds. brick pavement.	E. E. Allen, Supt. of Sts.
Wash.	Seattle	Feb. 26.	Concrete pavement on Highway No. 15.	County Engr.
W. Va.	Fayetteville	Feb. 26.	Macadam, brick, concrete and asphaltic concrete road improvement; cost, \$950,000.	K. J. McGrath, Engr., Mt. Hope.
N. B.	St. John	Feb. 26.	400 tons of asphalt	G. F. Fisher, Comr. of P. Wks.
Wash.	Renton	Feb. 27.	Paving on Highway No. 3A.	Co. Engr., Seattle.
S. Dak.	Hayti	Noon, Feb. 27.	Furnishing 1 to 5 road graders.	A. N. Johnson, Co. Aud.
Fla.	Jacksonville	4 p.m., Feb. 28.	18,746 sq. yds. bitulithic and 1,514 sq. yds. brick gutter.	L. D. Smooth, Comr. P. Wks.
Wash.	Seattle	Feb. 28.	Concrete or brick pavement, cost \$100,000.	S. J. Humes, Co. Engr.
Ky.	Tompkinsville	Feb. 28.	Street improvement, cost \$25,000.	City Clerk
Ky.	Whitley City	Feb. 28.	Street paving, cost \$30,000.	Mayor.
Conn.	Manchester	March 1.	Concrete walks and curbs, cost \$23,000.	J. F. Bowen, Town Engr.
Ky.	Tompkinsville	Mar. 2.	12 miles county road.	County Clerk
Ind.	Crawfordsville	10.30 a.m., Mar. 8.	Constructing gravel road.	Dr. W. F. Batman, Co. Aud.
O.	Cadiz	March 15.	County road work; cost, \$16,000.	County Clerk.
O.	Kent	Noon, Mar. 18.	Improving several streets	E. S. Royer, Village Engr.
Ill.	Canton	Mar. 30.	Road work, \$20,000 available.	E. F. Molsinger, Co. Highway Supt.
Ill.	Naperville	Mar. 30.	Concrete paving, \$105,000 available.	C. A. Ashley, City Engr.
Ill.	Virginia	April 1.	Road improvement; cost, \$14,000.	Co. Clerk.
Ky.	Madisonville	Apr. 3.	Two miles macadam road.	County Clerk
SEWERAGE.				
Minn.	Austin	10 a.m., Feb. 10.	Constructing tile drainage ditch.	O. J. Simmons, Co. Aud.
O.	Cleveland	noon, Feb. 12.	Storm and sanitary sewers in East View.	Pease Engrg. Co., Marshall Bldg.
Ind.	Anderson	Feb. 12.	9,500 feet of sewer, cost \$13,000.	E. A. Funk, City Engr.
Wis.	Waukesha	Feb. 12.	Improving septic tank and installing grit chamber; cost, \$8,000.	W. Powrie, City Engr.
N. J.	Millburn	8 p.m., Feb. 13.	Making sewer connections	Wm. Byrd, Chrm. Twp. Com.
Minn.	St. Paul	10.30 a.m., Feb. 13.	Constructing sewers	H. W. Austin, Pur. Agent
la.	Primghar	Feb. 13.	Tile drains, cost \$22,000.	J. C. Kerrigan, Co. Engr.
N. J.	Ridgefield	9 a.m., Feb. 14.	Constructing sewer system.	C. F. Blood, Engr., Morsemere, N. J.
Ind.	Lafayette	Feb. 14.	33,613 feet 8 to 12-inch vit. sewers, 6 jobs, total cost \$56,236	H. B. Overesch, City Engr.
O.	Wyoming	noon, Feb. 14.	Constructing several sewers.	G. H. Eversman, Village Clk.
N. Y.	New York	2 p.m., Feb. 14.	600 ft. of wash borings for sewer work.	Bureau Sewers, room 2103.
N. Y.	Brooklyn	11 a.m., Feb. 14.	Sewer construction, cost \$375,000.	L. H. Pounds, Boro. Pres.
O.	Coshocton	Feb. 15.	Constructing 36-inch sewer	Sam Ashman, Ser. Safety Dir.
D. C.	Washington	2 p.m., Feb. 15.	Constructing 6,400 ft. 10 to 30-in. pipe or masonry sewers.	Chief Clerk, Engr'g. Dept., Room 427, District Bldg.
Minn.	Mankato	2 p.m., Feb. 15.	Tile drainage ditch, cost \$5,229.	C. L. Kennedy, Co. Aud.
Minn.	Mankato	2.30 p.m., Feb. 15.	Tile drainage ditch, cost \$10,561.	C. L. Kennedy, Co. Aud.
Minn.	Mankato	3.30 p.m., Feb. 15.	Tile drainage ditch, cost \$5,144.	C. L. Kennedy, Co. Aud.
Minn.	Blue Earth	10 a.m., Feb. 16.	Tile drainage ditches, cost \$15,858.	Robert Miller, Engr.
Minn.	Blue Earth	11 a.m., Feb. 16.	Tile drainage ditches, cost \$2,617.	C. L. Hagger, Engr.
Minn.	Blue Earth	1 p.m., Feb. 16.	Tile drainage ditches, cost \$9,952.	C. L. Hagger, Engr.
Minn.	Blue Earth	1.30 p.m., Feb. 16.	Tile drainage ditches, cost \$2,537.	C. L. Hagger, Engr.
la.	Mason City	2 p.m., Feb. 19.	Tile drainage ditches, requiring 40,000 feet 6 to 28-inch tile	C. L. Hagger, Engr.
O.	Springfield	Noon, Feb. 19.	Sanitary sewers in four streets.	Geo. E. Frost, Co. Aud.
Kans.	Humboldt	Feb. 19.	Constructing main and lateral sewers.	C. E. Ashburner, City Mgr.
N. J.	Camden	8 p.m., Feb. 19.	Sewers in many streets.	C. H. Shaffner, City Clerk.
N. Y.	Oswego	2 p.m., Feb. 20.	6,800 feet 6 and 12-inch sewers.	L. E. Farnham, City Engr.
Ill.	Garden Prairie	2 p.m., Feb. 20.	16 miles 6 to 27-inch tile drains.	Comrs. of Coon Drainage Dist.
Mass.	New Bedford	8 p.m., Feb. 21.	Centrifugal pump and electric motor.	William Williams, Con. Engr.
Idaho	Emmett	Feb. 21.	Disposal plant and 7,800 ft. 15 and 24-in. sewers; cost, \$17,000	G. W. Knowles, Engr.
N. Y.	Brooklyn	11 a.m., Feb. 21.	Sewage pumping equipment.	Bureau of Sewers, 215 Montague Street.
Va.	Roanoke	Feb. 24.	Constructing small sewer	F. L. Gibboney, City Engr.
Ind.	Ft. Benj. Harrison	Feb. 26.	Sewage disposal plant at Fort.	Quarter-Master, Federal Bldg., Chicago.
Qnt.	Toronto	Feb. 27.	Constructing wrought iron drainage system for the Rose-dale Bridge	Field Office, 89 Castle Frank Road.
Mont.	Big Sandy	8 p.m., March 1.	Disposal plant, 1,850 ft. tile sewers, 600 ft. c. i. force main and pumping station with electric pumps.	Miracle Engrg. Co., Ford Bldg., Great Falls.
Minn.	Mankato	9.30 a.m., Mar. 5.	Constructing sewer in Rock Street.	F. W. Bates, City Clerk.
Wis.	Chilton	Mar. 6.	Constructing sewer system, cost \$22,000.	Jerry Donohue, Engr., Sheboygan, Wis.
Ind.	Shelbyville	March 6.	Constructing sewer	City Engr.
O.	Cleveland	Mar. 7.	Constructing sewers in East View.	C. F. Volk, Village Clk. of East View.
Ill.	Hillsboro	April 1.	Constructing sewer system; cost, \$12,000.	W. A. P. Warren, City Engr.
India.	Calcutta	2 p.m., June 1.	Storm water pumping plant	C. C. Chatterjee, Sec. Corp. of Calcutta.
WATER SUPPLY.				
Nebr.	Springfield	Feb. 10.	Repairing wood water tank.	C. H. Olderog, Village Clk.
Minn.	Duluth	11 a.m., Feb. 10.	Laying gas and water mains.	Manager, Water & Light Dept.
Ont.	York	Noon, Feb. 12.	Furnishing cast iron pipe, valves and hydrants.	Frank Barber, Township Engineer, 57 Adelaide St., East, Toronto.
Ill.	Joliet	2 p.m., Feb. 12.	Three motor-driven centrifugal pumps, 1,000,000 to 3,000,000 gallons capacity; switchboard, switches and motor starters	Mayor
Mich.	Pontiac	Feb. 13.	90 tons pig lead and 30 tons 3/4-inch extra strong lead pipe	L. A. Cambrey, City Clk.
Ga.	Savannah	Noon, Feb. 13.	Boring one 12-inch artesian well.	E. R. Conant, Chief Engr.
O.	Akron	Feb. 14.	Two 300-h. p. water tube boilers.	Dir. Pub. Service
Minn.	Detroit	8 p.m., Feb. 15.	25,000 feet 4 to 8-inch mains, 37 hydrants and 47 valves.	E. J. Bestick, City Clerk.

## BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Ariz.	Casa Grande	Feb. 15	Power plant and water system, cost \$30,000	V. A. Thompson, Engr., Phoenix
Mo.	St. Louis	noon, Feb. 16	Furnishing and erecting one million gallon steam driven turbine centrifugal pump	E. R. Kinsey, Pres. Bd. P. S.
Minn.	Thief Riv. Falls	8 p.m., Feb. 20	2 12-inch wells, about 240 feet deep	A. H. Fasel, City Clerk
N. J.	Bayonne	4 p.m., Feb. 20	Furnishing and laying 1,488 feet 6 and 8-inch c. i. pipe	City Engineer
N. Y.	Albany	Feb. 21	Water purification plant for state asylum at Newark, N. Y.	L. F. Pilcher, State Architect
N. Dak.	Mohall	8 p.m., Feb. 27	Waterworks system, including mains, hydrants, pumping plant, steel tower and tank	Tollef Syverson, City Aud.
Ill.	Watseka	March	1. 7,500 ft. water main construction	J. L. Smiley, Commissioner.
Ill.	Springfield	Mar.	1. 3.5 miles 24-inch water main extension; cost, \$90,000	City Engineer.
Mont.	Big Sandy	8 p.m., March	1. Pump station and pumps, 3,500 ft. 6-in. steel main and 100,000-gal. tank on 75-ft. tower	Miracle Engrg. Co., Ford Bldg., Great Falls.
Wis.	Portage	Mar.	1. Filter plant, cost \$30,000	L. P. Wolff, Germania Bldg., Engr.
Wis.	Chilton	Mar.	6. Constructing water works system, cost \$45,000	Jerry Donohue, Engr., Sheboygan, Wis.
O.	Ravenna	Mar.	10. Improving water works system	S. B. Horsfall, Dir. P. Serv.
Ill.	Gibson City	April	1. Constructing water and light plant	City Clerk.
MISCELLANEOUS.				
Quebec	Montreal	Feb.	9. Motor sweepers and motor street sprinklers	Paul E. Mercier, City Engr.
Ind.	Monticello	1 p.m., Feb.	10. Constructing drainage ditch	Geo. Thomas, Drainage Comr.
Ja.	Estherville	noon, Feb.	12. Constructing drainage ditches	J. J. Klopp, Co. Aud.
Minn.	W. M'n'p'l's	7:30 p.m., Feb.	13. Constructing municipal gas plant	E. A. Close, Recorder.
D. C.	Washington	Feb.	13. Furnishing gates, pipe fittings, silica sand and grit, creosote oil, etc.	Gen. Pur. Officer, Pan. Canal.
N. Y.	New York	noon, Feb.	13. 900 additional brooms for ash and paper carts	John Fetherston, Comr. St. Cleaning
N. Y.	New York	3 p.m., Feb.	15. Constructing concrete bulkhead	Dept. of Parks, Municipal Bldg.
South Africa	Johannesburg	Feb.	15. Machinery for utilizing by-products at municipal abattoirs	Municipal Council.
Ont.	London	Feb.	15. Furnishing 7,000 bbls. of cement and vitrified sewer pipe during 1917	Harry Brazier, City Engr.
N. J.	Camden	7:30 p.m., Feb.	15. 2 chasses for police patrol	City Clerk.
N. Y.	New York	10:30 a.m., Feb.	16. Furnishing solid rubber tires and fire appliances	Robt. Adamson, Fire Comr.
Mich.	Lansing	4 p.m., Feb.	19. Portland cement during 1917	City Engr.
D. C.	Washington	Feb.	19. Furn. and instal. one 40-ton and ten 4-ton bridge cranes at Norfolk, Phila. and Puget Sound Navy Yards	Bureau of Yards & Docks, Navy Dept.
N. J.	Washington	Feb.	19. Lighting streets for five years	J. H. Hahn, Boro Clerk.
Wis.	Wautona	10:30 a.m., Jan.	20. 1,000 bbls. cement	Fred Grimm, Co. Highway Comr.
Mont.	Great Falls	8 p.m., Feb.	20. Motor combination street sprinkler and sweeper	L. B. Evensen, City Engr.
Fla.	Tampa	Feb.	20. 40 H. P. Caterpillar tractor	W. P. Culbreath, Co. Clk.
D. C.	Washington	Feb.	26. One-ton bucket dredge for Mare Island (Cal.) Navy Yard	Bureau of Yards and Docks, Navy Dept.
S. C.	Charleston	noon, Mar.	1. Constructing 1,000 ft. of concrete sea wall and filling behind the wall with material dredged from the river	Jas. H. Dingle, City Engr.
La.	Alexandria	8 p.m., March	7. Levee constr., requiring 2,000,000 cu. yds. excav.	Bd. of State Engrs., New Orleans Court Bldg., New Orleans.

## STREETS AND ROADS

**Berkeley, Cal.**—Commissioner of Public Works Robson and City Attorney Stringham will confer with Assemblyman C. C. Young at Sacramento, with reference to the bill to be placed before the legislature asking for an appropriation for the university to pave and improve the streets adjoining the university property. The roads affected by the measure are certain portions of Allston Way, Oxford St., Bancroft Way and Hearst Ave. Estimated to cost about \$26,000.

**Maricopa, Cal.**—Business section of the city is to be paved. E. F. Ballagh, City Clk.

**Sunnyvale, Cal.**—Chamber of Commerce decided that the proposed county bond issue for good roads should be given all the support possible.

**Mayo, Fla.**—Citizens voted road and bridge bonds to amount of \$250,000.

**Pensacola, Fla.**—G. Rommel, Jr., Pensacola, Engr. Escambia county, plans road from proposed Escambia River bridge to connect with Santa Rose county.

**Atlanta, Ga.**—A magnificent boulevard connecting the state Capitol in Atlanta with Stone Mountain is a Southern adaptation of the "Place de Concorde" proposed by a local artist. His idea is to build the boulevard in a straight line leading to the side of the mountain on which the great Confederate Memorial is to be carved. At intervals of a mile he would widen the boulevard into a park space adorned with a building to represent one of the thirteen Confederate states, and he would surround three sides of Stone Mountain with a great park.

**Kellogg, Idaho.**—The Council decided to pave Main St. with concrete from the end of the present paving to the Wardner line, and a resolution was passed to create a special paving district.

**Lewiston, Ida.**—From report, citizens are working to make possible the construction of a highway through the Clearwater country from Lewiston across the Bitter Root divide to Missoula.

**Belleville, Ill.**—Mayor Mollman petitioned by property owners for concrete instead of brick for the paving extension of the Rockroad in East St. Louis on State St.

**Champaign, Ill.**—Champaign County Bd. of Suprvs. postponed action on road bond issue until March. The types of road improvement proposed by the committee's report include 50 miles of brick, 10 ft. wide, estimated to cost \$627,000; 100 miles of concrete pavement, estimated to cost \$825,000, and 32 miles of macadamized road, at an estimated cost of \$188,000, with an additional cost for drainage, etc., of \$13,000, bringing the total to \$1,653,000. The roads to be improved with the three types of highway construction, following the routes laid out in the system adopted, are: Brick—Urbana, north, through Thomasboro and Rantoul, to Ludlow. Urbana, east, through St. Joseph, to Ogden. Champaign, south, through Savoy, Tolono and Pesotum, to the county line. Champaign, west, through Rising and Mahomet, to the county line. Concrete—Five Points, north to Dewey, Fisher and Foolsland. Rantoul, to Gifford and Penfield. Thomasboro to Flatville. St. Joseph to Royal, except one mile. Urbana to Philo, Sidney, Homer, Longview and Broadlands, and to county line east of Broadlands. Homer, south, one mile. Tolono to Sadorus and Ivesdale. Champaign to Bondville and Seymour. Macadam—Mahomet to Fisher, except 3 1/2 miles. Dewey, north, three miles, into East Bend Twp. Dewey to Rantoul. Seymour, to Ivesdale, except 5 miles. Pesotum, east, to C. & E. I. tracks. Longview, south, to county line. From Sidney-Longview Rd., west, 1 mile, to C. & E. I. tracks.

**Joliet, Ill.**—An ordinance for improving Onelda St. from Center St. to Prairie Ave., by laying an asphaltic concrete pavement, was adopted. Estimated cost, \$21,631.15.

**Moline, Ill.**—Board of local improvement to have a hearing in three proposed street pavement projects, to cost \$100,817, as follows: Twentieth Ave., 16th to 18th Sts.; 18th St. B., 20th to 23d Ave.; width, 25 ft.; monolithic type of brick; estimated cost, \$17,984. Seventh Ave., 7th to 2d St.; 2d St., 16th to 17th Ave.; 3d St., 17th to 19th Ave.; width, 25 ft.; monolithic type of brick; estimated cost, \$25,296. Fifteenth St., 23d to 29th Ave.; width, 30 ft.; 14th St., 28th to 34th Ave.; width, 25 ft.; 26th Ave., 15th to 16th St.; 28th Ave., 14th to 16th St.; 29th Ave., 14th to 16th St.; asphalt; estimated cost, \$57,627.

**Moline, Ill.**—City Council passed fine sidewalk ordinance, providing for approximately six miles of new walks; will cost city \$7,000.

**Pekin, Ill.**—Mayor Schaefer announced two blocks of the alley north of Court St., between Third and Fourth, Margaret and Court, will be repaved.

**Rock Island, Ill.**—Legislative Committee of the State Association of County Clerks, Supervisors and Commissioners endorsed an amendment to the state law so that the matter of a bond issue for hard roads can be submitted at a special election and a mill tax voted for the retirement of the same in counties levying taxes up to the 75 cents on the \$100 valuation. The proposition referred to is of special interest here where the members of the Board of Supervisors have pending before them a plan for the submission of a \$1,000,000 bond issue for hard roads in the spring. A bill covering the matter has already been introduced in the legislature by Senator Dailey, Peoria. Under the present law, only bond issues for the erection of county jails and court houses



may be voted on at special elections in counties under the classification referred to.

**Springfield, Ill.**—Illinois will make tremendous strides in the improvement of its roads if the present legislature adopts a program prepared for its consideration. There are three main propositions, as follows: Submission of a \$60,000,000 bond issue to the voters in November, 1918, for the construction of hard roads on a comprehensive scale. Appropriation of twice as much as two years ago for the building of roads. Including what is asked from the state and equal sums from the counties and from the federal government and bond issues already voted in Cook and Vermillion counties, a total of nearly \$10,000,000 would be expended in Illinois during the next biennial period. An increase of 50 per cent in the amount of automobile license fees in order to furnish additional funds for road construction.

**Auburn, Ind.**—Bids received Feb. 15, 1917, at 10 a. m., by Treasurer of De Kalb County, for sale, \$20,000, \$56,000, \$27,000 and \$27,000 highway improvement bonds, 4 per cent, ten years. Sam G. Stone, Treas.

**Bloomington, Ind.**—County Treasurer Rolla Walker sold two sets of pike road bonds on the Henry Hunter road, amounting to \$16,000, for \$680.50, and the B. P. Cooter road bonds of \$14,300, for \$607.75, to the R. L. Dollings Co., of Indianapolis.

**Connersville, Ind.**—Fayette county highway bonds to the amount of \$18,720.40, 4½ per cent, ten years, were sold to J. F. Wild & Co., Indianapolis, for \$762.50 premium.

**Decatur, Ind.**—Adams County highway bonds to the amount of \$11,920 to J. F. Wild & Co., Indianapolis, for \$475.75 premium and accrued interest.

**Elkhart, Ind.**—A petition for a pavement on South Sixth St. from Hickory St. to Cleveland Ave. was filed with the City Clerk.

**Fort Wayne, Ind.**—Board of works at their next meeting have up for adoption the resolutions for the first streets to be improved during the coming summer. The list includes: Fox Ave., from Taylor St. to Home Ave.; Glasgow Ave. from Dwenger Ave. to Maumee Ave.; Lafayette St., from Wiebke St. to McKinnin Ave., except the intersection of Rudisill Blvd.; Andrews St., from Fourth St. to Putnam St.; Oak St., from Division St. to Ohio St.; Sixth St., from Cass St. to Calhoun St.; Melite St., from Harrison St. to Hoagland Ave.; Wald St. and Wayne St., from Grant Ave. to Glasgow Ave.

**Goshen, Ind.**—A \$1,000 issue Elkhart County highway bonds, 4½ per cent, 5 years, sold to the R. L. Dollings Co., of Indianapolis, for \$22.50 premium.

**Indianapolis, Ind.**—An ordinance was introduced appropriating \$1,200 to buy an oil spreader for use on unimproved streets, and \$6,500 was to a fund to buy a device for the cleaning of sewer inlets.

**Indianapolis, Ind.**—Resolutions adopted: Highland Ave. from Marlowe to Michigan; permanent imp'v'm't. Paris Ave., from 23rd to 25th; cement walks. Paris Ave. from 23rd to 25th; curb. Park Ave. (w. s.), from 29th to 30th; cement walks. Southern Ave., from Boyd to Shelby; cement walks. Southern Ave., from Boyd to Shelby; curb. Winthrop Ave., from 40th to 42nd; permanent improvement.

**New Albany, Ind.**—The Bd. of Public Works approved the plans and specifications for the proposed improvement of Spring St. from Silver St. to Beharrell Ave. by paving roadway.

**Portland, Ind.**—Two issues Jay County highway bonds in amounts of \$18,000 and \$15,200 were sold to J. F. Wild & Co., Indianapolis, for a total premium of \$1,255.25. These are 10-yr. bonds and bear 4½ per cent interest.

**Rockville, Ind.**—Four issues Parke county highway bonds, a total of \$26,552, were sold to J. F. Wild & Co., of Indianapolis, for \$361.14 premium.

**Davenport, Ia.**—Grading, paving and other improvements are to be made at McClellan Heights at a cost of \$75,000, according to the announcement of F. E. Wettstein of the Davenport Land & Improvement Co.

**Marshalltown, Ia.**—The paving budget for the year will be in excess of two miles. In addition to the large unfinished portion of the 1916 contracts which are to be completed. Following are the payments petitioned for: Main St., Thirteenth to Seventeenth, 4½ blocks;

Fremont St., Fourth to Eighth, 4 blocks; Summit St., Seventh to Ninth, 2 blocks; Sixth St., Church to Linn, 1 block; Eleventh Ave., Main to State Sts., 1 block; Third St., Church to Nevada, 2 blocks; Marion St., Center to First Ave., 1 block; Jerome St., Fifth to Seventh, 2 blocks; total 18½ blocks. In addition there is Twelfth St., from Boone to Doty, that is to be included, and South Fifth St. and Nevada St., the latter if the street railway line is built on that street.

**Mason City, Ia.**—City plans paving during 1917, including Trinidad sheet asphalt paving to cost \$331,136, and reinforced concrete paving to cost \$61,394. Fred P. Wilson, City Engr.

**Tipton, Ia.**—Community Club discussed the question of oiling all the county roads leading out of Tipton for a distance of two or three miles.

**Wichita, Kan.**—Ordinance approved authorizing improvement bonds of \$1,183.43, which will consist of two amounts, \$800 and \$383.93, to pay the cost of opening and extending Bort Ave. from First St. to Second St.; 22d St. from Arkansas Ave. to Armstrong Ave.; 23d St. from Lawrence Ave. to Fairview Ave.; opening all between Lawrence Ave. and Topeka Ave. from 17th to 18th St.; opening Martinson Ave. across the Anthony branch of Missouri Pacific Railway Co.'s right of way; opening Laura Ave., across the right of way of the Atchison, Topeka & Santa Fe Railway Co.; opening Mascott Ave. from 21st St. to 25th St.; opening Orme St. from eastern terminus thereof to Lulu Ave. O. H. Bentley, Mayor. H. D. Lester, City Clerk.

**Covington, Ky.**—City Engineer H. G. Meiners has completed the surveys for the Hermes Ave. improvements; also is working on the Madison Ave. plans.

**Henderson, Ky.**—W. Hopkins, City Engineer, plans to pave several blocks with brick.

**Newport, Ky.**—To pave Third and York streets plans are being made by City Commissioners.

**Owensboro, Ky.**—Announcement was made that contracts have been approved for the building of 50 miles of roads and the resurfacing of 10 miles of roads at a cost of \$350,000. Of the remaining \$250,000 the state department contemplates the use of about \$100,000 in the reconstruction of pikes running out of Owensboro. This will leave about \$150,000 for the extension of inter-county-seat roads in Daviess county.

**Alexandria, La.**—Bids received for road district No. 12, \$56,000 bonds, Feb. 27, noon. R. H. Jackson, Pres. Bd. of Supvrs.

**Bridgehampton, L. I.**—The Town Bd. of Southampton will act on a petition of Bridgehampton taxpayers, asking that the Devon-Bridgehampton State Highway be constructed through the Bridgehampton Main St. to a width of 25 ft., for a distance of 1,500 ft. The survey calls for a road 16 ft. wide. The new highway, for which bids are advertised, will continue the Quogue-Southampton concrete State Highway. This road, by action of the voters of the town, is built to a width of 20 ft. The board will also consider raising money for widening the Devon-Bridgehampton Highway to 20 ft.

**Geismar, La.**—Bids received Feb. 28 at 11 a. m. for J. & J. Road District No. 2, \$50,000 bonds. Leon Newman, Pres. Bd. of Supvrs.

**Islip, L. I.**—Citizens of East Islip presented petition requesting the board to use the \$5,500 allotted to their village for permanent roads in the construction of an oyster shell roadbed in Bay View Ave., which thoroughfare leads to the public waterfront park.

**Augusta, Me.**—A bill has been introduced in the Legislature for the issuance of \$4,000,000 road bonds.

**Beverly, Mass.**—Alderman Thompson offered an order providing for the laying of 670 ft. of curbing, on Mason St., at an estimated cost of \$650. Referred to the Committee on Public Service and Aid.

**Great Barrington, Mass.**—State and town officials plan state road through town from Belcher Sq. to Monument Mt.

**Lowell, Mass.**—The plans of the State Highway Commission and the Lowell city engineer as agreed upon by state and city, were presented at hearing before the county commission at East Cambridge on the proposed construction of a road directly through Locks and Canals land, bordering the Merrimack River, off First St., in the state highway

project connecting Lowell and Lawrence. No definite action was taken.

**Springfield, Mass.**—Petition presented to Aldermen requesting that Taylor St. be extended from Chestnut to Spring sts. so as to connect with Summer St., was referred to the Board of Public Works.

**Flint, Mich.**—Petitions for sidewalks on each side of all streets in the plat of Indian Village, on both sides of Jasmine St., from Ward St. to Floral Park Ave., and on Reid St., from Vosburg St. to Downey St.; also for the grading of Reid St. from Vosburg St. to Downey St., and for the paving of Jasmine St., from Ward St. to Floral Park Ave., were referred to the street committee.

**Flint, Mich.**—Citizens voted a bond issue of \$36,881 for constructing pavements.

**Duluth, Minn.**—Judge Fesler, after hearing a petition, filed in District Court an order to proceed with construction of a judicial highway of four and one-half mi. along the Koochiching-St. Louis County line. The cost will approximate \$30,000, according to the estimate furnished by the engineer in charge. The expense will be borne in equal shares by the two counties.

**St. Cloud, Minn.**—Commissioner Maybury's report covering a program of improvements to be made and completed during the year 1917. Sidewalks to be constructed on the west side of Fourth Ave. southeast from First St. southeast to Third St. southeast; Seventh Ave. north from Ninth St. to 12th St. north on the west side of the avenue; on Seventh St. south on the north and south sides of the street from 12th Ave. to 16th Ave.; on the south side of Seventh St. from 12th Ave. to the east line of 10th Ave.; on Seventh St. south on the north side of the street from Tenth Ave. to Ninth Ave. Paving Fifth Ave. south from Second St. to Seventh St. south; Court Sq.; First St. north from Seventh Ave. to Court House Square; First St. north from Court House Square to Ninth Ave.; Eighth Ave. north from St. Germain St. to Court Square; Seventh Ave. north from First St. to tracks; Fourth Ave. north from St. Germain St. to Fifth Ave. Curbing Fourth Ave. north from St. Germain St. to Fifth Ave. north. Opening streets: Acquiring and the opening of an alley in block 11, Edelbrock's addition, and block 8, Cramb's addition; acquiring of land for road purposes and the opening of Third Ave. northeast from East St. Germain St. to Third Ave. and Second St. northeast; acquiring for street purposes 11th Ave. south from Eighth St. to Ninth St. south; opening an alley 12 ft. in width between Lots 8 and 11, Lots 8 and 9, a and 8, 3 and 7, 6 and 4 in Cooper's sub-division of block 39, Wilson survey, same to connect with the alley running north and south through block 62. Grading Fifth Ave. southeast from Fourth St. south to Sixth St. and Fifth St. from Fifth Ave. to Wilson Ave.; Fourth Ave. south from Three and ½ St. to Fourth St. south. An estimate covering grading, curbing, sewer and water connections and paving has been presented to the resident director of the State Normal school board and further improvements will be ordered in case these appropriations are granted, including the grading of 10th St. south from Fifth Ave. to First Ave.

**Winona, Minn.**—The Minnesota State Highway Comm. was informed that \$284,788 has been apportioned to Minnesota for this year under the federal aid road law as the state's share in the second annual distribution of the \$10,000,000 fund. John H. Mullen, deputy state engineer in charge of roads, said that the commission has tentatively decided on applying the aid on about 6,000 miles of road connecting all the main towns and county seats of the state, and including all the main roads of travel.

**Aberdeen, Miss.**—Election resulted in favor of issue Second District road bonds; \$40,000.

**Meridian, Miss.**—The City Council has passed an ordinance which provides for the issuance of refunding sidewalk bonds; \$28,000.

**Starkville, Miss.**—\$34,000 bonds to improve roads in Beat 2 sold by Kibbeha county.

**Chillicothe, Mo.**—City to grade, curb, pave and otherwise improve Ann St., from the west side or line of Washington St. to the east side or line of Cherry St.

**Chillicothe, Mo.**—City will improve Wianut St. from the north side of Ann

St. to the south side of Clay St. by grading, curbing and paving.

**Chillicothe, Mo.**—City made plans to grade, curb, pave and otherwise improve 1st St. from west side or line of Elm St. to the east side or line of present pavement on Locust St.

**Chillicothe, Mo.**—City council approved plans and specifications of city engineer and ordered the improvement for the widening of the paving of Jackson St. from Elm to Vine St.; also for the paving of First St. from Elm to Locust St.

**Higginsville, Mo.**—Geologists who have been investigating here several months say Higginsville and lands adjoining are underlaid with enough rock asphalt to pave a million miles of streets. Dr. Roy Cross and Dr. Walter Cross of Kansas City have tested the asphalt and their report is that it is as fine "as any found in the United States or foreign countries." They say that besides being serviceable as paving material it can be made into a superior grade of roof paint and is rich in aniline dyes. Committees of property owners are circulating petitions to have the city council order several streets paved with Higginsville rock asphalt as demonstration streets. They wish to do for Higginsville asphalt what Carthage, Mo., has done for Carthage stone.

**Joplin, Mo.**—City made plans to grade, subgrade and pave to the full width the 16-ft. alley next east of Pearl Ave., from Fourth St. to Fifth St., with Class E two course concrete pavement. Hiram Phillips, City Clerk.

**Joplin, Mo.**—City council will consider the paving of Main St. from 20th St. to the county line with concrete.

**St. Joseph, Mo.**—Ordinance passed for the construction of concrete sidewalks along the south side of Charles St.

**Fremont, Neb.**—The city Council created three new paving districts, for more paving on Main, repaving of Park and repaving of Fifth. A petition was presented for paving First St. from the limits into the business section.

**Bayonne, N. J.**—Ordinance introduced to Board of Commissioners for the improvement of West 55th St., from Ave. C to Broadway. The entire width to be regulated and graded. New blue stone curb to be set in concrete on each curb line, present curb to be redressed and reset in concrete. New concrete sidewalk, five ft. wide, to be laid on each sidewalk. Wm. P. Lee, City Clerk.

**Camden, N. J.**—Board of chosen freeholders of the county will receive bids Feb. 14 at 10.30 a. m. for the purchase of road bonds amounting to \$73,500.

**Collingswood, N. J.**—The question of issuing \$137,000 street paving bonds considered by Borough Council.

**Elizabeth, N. J.**—For street grading bonds of \$25,000, Messrs. Kissel, Kinnicut & Co., New York, successful bidders. Dennis F. Collins, City Controller.

**Newark, N. J.**—Resolution adopted by the Bd. of Street and Water Comrs.: Repaving of Mt. Pleasant Ave. from Clay St. to Fourth Ave., with 4-in. wood block pavement on the old concrete foundation, renewing the said foundation and resetting and redressing curb and readjusting sidewalks. Repaving of Mt. Pleasant Ave. from Fourth Ave. to Harvey St., with asphalt pavement (2-in. surface, 1½-in. binder) on the old concrete foundation, renewing the said foundation and resetting and redressing curb, and readjusting sidewalks. M. R. Sherrerd, Chief Engr.

**Trenton, N. J.**—Commr. Fell of the City Comm., introduced ordinances providing for the pavement of several streets which the Commission has agreed to improve this year: Oxford St., from Southard to westerly terminus, with vitrified brick; Culver Ave., from Hamilton Ave. to Greenwood Ave., with sheet asphalt; Lincoln Ave., from North Clinton Ave. to Assunpink Creek, with sheet asphalt; Parkside Ave., from Stuyvesant to Oak Lane, with sheet asphalt; Elmhurst Ave., from Stuyvesant Ave. to Bellevue Ave., with sheet asphalt.

**Bayside, N. Y.**—For about \$141,000 city plans to widen Bell Ave.

**Brooklyn, N. Y.**—Executive Committee of the city's Committee on City Plans, unanimously adopted the resolution urging that Kings Highway, between Ocean Ave. and the Rockaway Blvd. be placed upon the official city map. Also recommends that the main part of the cost be paid by the city and borough.

**Cooperstown, N. Y.**—A bill has been introduced in the legislature which pro-

vides for the issuance of \$35,000 street improvement bonds.

**Medina, N. Y.**—Merchants and property owners on Main St. have revived the improvement idea of paving the main business highway from the New York Central tracks northward to Commercial St. Some members of the Chamber of Commerce and others suggest that the street should be wired when this improvement is begun, so that the street would be equipped with ornamental side lights.

**Southampton, N. Y.**—For about \$50,000 town plans to pave Main St. and Jobs Lane.

**Gastonia, N. C.**—Bids received Feb. 15 at 8 p. m., street improvement bonds of \$150,000. T. A. Ratchford, City Clk.

**Lenoir, N. C.**—May 8 by Caldwell county an election on \$250,000 bonds to build roads.

**West Asheville, N. C.**—Town Clk. H. B. Posey receiving bids Mar. 1 noon, \$170,000 street improvement bonds.

**Fargo, N. D.**—City Comm. approved plans submitted by city engineer for the opening and widening of 13th Ave. south between 10th and 11th Sts. and 11th St. from 13th Ave. south to a point 300 ft. south, in Huntington's addition, and the uniform widening of 11th St. south between 11th and 13th Aves. south, in Erskine's addition.

**Cincinnati, O.**—Residents along Minion Ave. in Wickwood urge Council Committee on Streets to improve their street with reinforced concrete.

**Hamilton, O.**—Two and one-fourth miles of Dixie highway in Warren Co. will be paved this summer.

**Hamilton, O.**—The Hamilton chamber of commerce, which has been actively pushing the Dixie Highway paving improvement, was advised that the section of 2.4 miles running through Warren county will be constructed this summer.

**Hamilton, O.**—County commissioners received the following bids on the \$118,000 road bonds: Ohio National Bank, Columbus, \$1,976.80; R. L. Dollings Co., Columbus, \$2,010; A. E. Aub, Cincinnati, \$2,075; Field-Richards & Co., \$1,711; Providence Savings Bank & Trust Co., Cincinnati, \$1,805.40; Beed, Elliott & Harrison, Cincinnati, \$1,841; Well, Roth & Co., \$1,635.40; First National Bank, Cleveland, \$1,992.60; Security Savings & Trust Co., Toledo, \$1,958.80; Oglesby, Barnitz Co., Middletown, \$2,075.00; E. Lauber Stokes, Philadelphia, \$2,279.80; Firbel Elischak, Cincinnati, \$2,201; New First National Bank, Columbus, \$2,843.80; Halsey, Stewart & Co., Chicago, \$2,101; Continental & Commercial Savings Bank, Chicago, \$2,105.

**Marion, O.**—Petitions were presented for sidewalks on both sides of Marion Ave. from south Prospect St. to Windsor St.; both sides of Girard Ave. from Duluth Ave. to Marion Ave.; on the south side of Congress St. from Barks Ave. to Underwood Ave., and on the north side of Woodrow Ave. from lot No. 9253 to Underwood Ave. Referred to the street and alley committee.

**Marion, O.**—Petition for paving Irey Ave. from Walnut St. to Superior St., referred to the street and alley committee.

**Marion, O.**—Ordinances adopted to proceed with the construction of paving on streets as follows: South Grand Ave., from Mt. Vernon Ave. to Center St.; Bellefontaine Ave., from the Pennsylvania tracks to Davids St.; Mary St., from the north end of the present paving to the Garden City Pike; Washington Ave., from State St. to Vine St.; Vine St., from St. James St. to Walnut St.; Hane Ave., from Church St. to Mt. Vernon Ave.; Senate St., from Silver St. to Kenton Ave.; McKinley St., from Olive Ave. to Park Blvd.; Miami St., from McKinley St. to Bellefontaine Ave.

**Massillon, O.**—City Solicitor George Williams will confer with state officials regarding the state's paying its share of paving Canal St. If successful in the undertaking the city will save \$7,000.

**Massillon, O.**—Mayor Frank L. Koontz in his annual report to council made the following recommendations: The paving of Erie St. from North to Walnut St. That the question of issuing bonds for the Sippo Valley trunk sewer and the storm sewer on Green St. be submitted to the electors at the earliest possible date. That all wires for the police and fire alarm systems in the business section of the city be placed under ground, and also that new wires be installed in the residence and outlying districts, as these are in poor condition. That

Columbia Heights be made a part of Massillon, and that a special driver be provided for the emergency patrol wagon.

**Oxford, O.**—The Village Council has authorized the issuance of street paving assessment bonds; \$10,000.

**Toledo, O.**—City Engineer Harry McClure announced nearly \$1,000,000 worth of paving and street improvements will be made this year. There will be a big letting of contracts late in February.

**Allentown, Pa.**—For paving 3 miles of streets city planning commission is making plans. C. D. Weinbach, City Engineer.

**Clarksville, Pa.**—Bids soon received by Council for macadam roads. T. E. Nyswaner, Boro. Clk.

**Erie, Pa.**—Road Comrs. of Millcreek, Harborcreek and North East Twps. have applied for state aid to improve the Buffalo Rd. and West Ridge Rd. The commissioners have agreed to pay their 25 per cent of the expense and have applied to the legislature at the instance of property owners in their townships.

**Johnstown, Pa.**—The ordinance for a \$25,000 bond issue, substituted for the original legislation, and which has been placed on the calendar by Council, does not specify the streets to be repaved. There are a number of streets in various sections of the city that are in need of repaving, but only those in the worst condition will be taken. Councilman Harris has had estimates prepared showing the approximate cost of the improvements. Fairfield Ave., from Butler alley to St. Clair Run, could be repaved with brick, on concrete base, for \$18,810. City would pay \$13,000 and the traction company \$5,810; could be resurfaced with asphalt for about \$11,700, city's share, \$8,100 and the trolley company's \$3,600. Washington St., from Clinton to Market, with Belgian block, on a concrete base with pitch filler, for approximately \$17,930. Using brick on a concrete base, the cost would be about \$10,100. Washington St., between Market and Walnut Sts., paved with Belgian block, would cost about \$10,250. The city would pay \$8,700 and the trolley company \$1,550. Paving with brick, on a concrete base, would cost the city \$5,000 and the trolley concern \$850, a total of \$5,850.

**Johnstown, Pa.**—Ordinances have been introduced in council for the paving of a number of thoroughfares, also for sanitary sewer work. As soon as these have been passed finally contracts will be let. This will give the contractors plenty of time in which to secure shipments of materials needed to carry on the work.

**New Castle, Pa.**—For paving 6 miles road with concrete Lawrence county receiving bids. T. A. Gilkey, 318-322 Mercantile Bldg., Engr. Address County Clerk, New Castle.

**Philadelphia, Pa.**—City plans to repave portion Chestnut St. with wood block. C. Albright, City Engr.

**Pittsburgh, Pa.**—Allied board of trade adopted resolutions requesting all civil and trade bodies to unite in pushing the plant for construction of the Monongahela Blvd. Plans of County Road Engineer W. McClurg Donley were very generally approved. The boulevard is to run to Schenley Park, with a branch over the 22d St. bridge. The boulevard proper is to begin at Forbes and Shinglass Sts.; cost is estimated at about \$900,000. A viaduct over the Panhandle Railroad to Fourth Ave. would cost about \$300,000 more.

**Penns Station, Pa.**—See "Sewerage."

**Philadelphia, Pa.**—See "Water Supply."

**Somerset, Pa.**—County Commissioners presented petition to the Court stating they have decided to build an improved highway from Berlin to Brotherton, on the Somerset and Bedford pike. The distance is 18,000 ft. Judge Ruppel directed that the matter be laid before a grand jury on March 1 at 10 o'clock. Estimates on the cost of three different kinds of road, as follows: Concrete, \$51,101; brick and concrete proportioned with 5,000 ft. of brick and 13,000 ft. of concrete, \$53,295; brick road with concrete base, \$66,275.

**Smethport, Pa.**—\$750,000 bonds to build highways voted by McKean county.

**Washington, Pa.**—T. J. Underwood, Washington Contr., Washington County, contemplates spending \$290,000 for road work this year.

**Wilkes-Barre, Pa.**—Councilman Murray submitted a report to Council in which he makes some recommendations. He urges the erection of new bridges



to replace the present weak wooden structures in the northern, southerly and Newtown sections of the city; that certain lanes be paved with material taken from other thoroughfares; asks for the repaving of South Main St. from Ross to Parish Sts.

**Central Falls, R. I.**—City contemplates improving portion Broad St. S. P. Cummins, City Engr.

**Greenville, Tenn.**—Road bond issue will be voted by the county in the near future amounting to \$100,000.

**Austin, Tex.**—E. J. Hernan, assistant director-general of the National Highways Association, has laid out the line of the Great Plains Rd. from Sweetwater to Clarendon.

**Dallas, Tex.**—The petitions of property owners on five streets, principally in North Dallas, for paving, were granted by the Bd. of City Comrs.: Magnolia St., from McKinney Ave. to Ross Ave., with bitulithic; on Reagan St., from Maple Ave. to Dickason St., with vibrolithic; on Crockett St., from San Jacinto St. to Bryan St., with bitulithic; on Boll St., from Ross Ave. to Byran St., with bitulithic, and on McKinney Ave., from Knox St. to Hester St., with Trinidad Lake asphaltic concrete.

**San Antonio, Tex.**—Comr. Kearny recommended that Arlington and Hahncke Courts be graded and repaired.

**San Antonio, Tex.**—City Council authorized the widening of Soledad St., between Romana and Houston Sts.; will be 60 ft. wide, which will allow for a 40-ft. roadway.

**Richmond, Va.**—City plans widening portion 15th St. C. E. Balling, City Engr.

**Fairmont, W. Va.**—Election Feb. 14 to vote on the question of issuing road bonds; \$330,000.

**Moundsville, W. Va.**—City plans paving High, Ramo, Hallow and 1st Sts. and Stringtown Rd. A. Purdy, City Engr.

**Welch, W. Va.**—The following districts will vote Feb. 17 on the question of issuing road bonds: Norfolk, \$160,000; Adkin, \$450,000; Browns Creek, \$565,000; Elkhorn, 210,000. W. W. Whyte, Clk. Co. Court.

**Olympia, Wash.**—County Engr. Weir started survey and preliminary plans for the 3½ miles of hard surface road to be constructed between Olympia and Tacoma.

**Port Angeles, Wash.**—City Council instructed city attorney to prepare a resolution of intention to improve Second St. from Valley to Tumwater and Third St. north as far as the Spit Rd., under the L. I. D. plan.

**Spokane, Wash.**—Spokane county is making preparations to invest \$10,000 in machinery for an asphalt plant, according to W. H. McCay, chairman of the Bd. of Comrs.

**Alma, Wis.**—Road bond of \$200,000 will be submitted to the voters Apr. 3.

**Chilton, Wis.**—At the April election a \$500,000 road bond issue will be submitted to the voters.

**Crandon, Wis.**—Road bond issue of \$100,000 will be submitted to the voters at the April election.

**Green Bay, Wis.**—City Council granted petition for pavements on Chicago and Pine Sts. Sidewalks on Howard, Clay, Grignon and Van Buren Sts.

**Madison, Wis.**—Eight counties will vote on the question of issuing bonds for good road improvement at the April election. Following is a list of counties and amount: Richland, \$500,000; Eau Claire, \$750,000; Washington, \$500,000; Calumet, \$500,000; Shawano, \$500,000; Buffalo, \$200,000; Polk, \$400,000; Forest, \$100,000.

**New Holstein, Wis.**—A petition for a referendum vote at the spring election on the proposed \$100,000 bond issue by Calumet County for the construction of a system of permanent trunk line highways was circulated in the village and was readily signed.

**Oshkosh, Wis.**—Commission Council adopted the specifications for the paving of the following streets: High St., from Wisconsin Ave. to West Algoma St.; Lake St., from Ceape St. to Lake Drive; Forest Ave., from High St. to Cherry Ave.; Mt. Vernon St., from Merritt St. to Park Ave.; Central Ave., from New York Ave. to Prospect Ave.; Grant St., from Jackson St. to Oakland Ave.; Cedar St., from New York Ave. to Grant St.; 17th St., from Oregon St. to the Soo Railway tracks; 14th St., from Oregon St. to Michigan St.; Knapp St., from 4th St. to 10th St. Resolutions were also adopted directing the Bd. of Public Wks. to advertise for bids for the construc-

tion of pavements on these streets, designating the kinds of materials, that might be used.

**Superior, Wis.**—Washburn County Bd. decided to adopt the county unit system of road construction and to use fully \$40,000 on trunk line roads during the coming year; also to expend \$12,000 on the highway between Spooner and Minong. In addition \$3,000 will be spent on the road from Shell Lake south. Another \$3,000 on the road between Spooner and Rice Lake; \$2,000 on the road from Stone Lake west to Spooner and \$1,000 will be allotted to each of the various towns. All this work will be done under the supervision of Mr. F. L. Irwin, road comr. of Washburn county, with the aid of the committee on highways, appointed by the County Bd.

**Walworth, Wis.**—Walworth County Bd. of Suprs. adopted a resolution that the trunk line of highways should be built under a system whereby White-water and Genoa Junction and East Troy and Sharon should be made the terminals.

**Vancouver, B. C.**—To resurface 16th Ave. from Grenville to Arbutus St. with bituminous-bound macadam, City Engr. F. L. Fellowes reported that it would cost \$6,572.05.

**Winnipeg, Man.**—Winnipeg Parks Bd. will extend the Assiniboine River driveway.

**Peterboro, Ont.**—The adoption of a good road system considered by Peterboro County Council.

**Brantford, Ont.**—City Council may have a permanent sidewalk laid on the north side of Burford St., between Brant St. and the western city limits. City Engr., T. Harry Jones.

**Toronto, Ont.**—The Works Dept. intends to pave Davenport Rd., between Bathurst St. and the G. T. R. track with a bitulithic pavement, having an 18-in. concrete base.

**West Hawkesbury Twp., Ont.**—A macadam road 2½ miles long, 14 ft. wide, will be constructed. Work to be completed Nov. 1, 1917. Jackson & Lee, engineers, Brantford, Ont.

## BIDS RECEIVED AND CONTRACTS AWARDED.

(\*Indicates Contract Awarded.)

**Linden, Ala.**—County to \*Nixon-Smith Constr. Co., Deatsville, Ala., for constructing 8 miles of clay road from Dayton to Thomaston and 2 miles of gravel or sand clay road south to here. A. L. Hasty, probate judge.

**Hanford, Cal.**—For constructing 11 miles of county highway at 75c. per cu. yd. for excavation, and 4½c. per cu. yd. for 1½-in. Topeka pavement on 2½-in. asphaltic concrete base, by county, to \*Blanchard-Brown Co., Call Bldg., San Francisco, Cal.

**Chino, Cal.**—City Council let for seven blocks of paving under Vroman act proceedings to \*George R. Curtis of Los Angeles, on 6th, 7th and D Sts.; calls for paving, sidewalk and curbing. Contract price is 11.4 cts. per sq. ft. for paving with asphalt, 10 cts. per sq. ft. for sidewalk, and 30 cts. per lin. ft. for curbing.

**Fillmore, Cal.**—Bids opened Dec. 30 by city to \*Crown Constr. Co., Culver City, Cal., at \$16,153, for grading 2,760 lin. ft., 40 ft. wide roadway and constructing 22,763 lin. ft. cement curb and 114,840 sq. ft. cement sidewalks.

**Huntington Beach, Cal.**—For improving Ocean Ave. bid opened Jan. 18 as follows: Leigh G. Garnsey, Central Bldg., Los Angeles, Cal., \$59,657; Rogers Bros. Co., Hibernian Bldg., Los Angeles, \$61,381.

**Mill Valley, Cal.**—By city to \*Ransome-Crummey Co., First Savings Bank Bldg., Oakland, Cal., at \$86,224, for improving several streets.

**Gainesville, Fla.**—\*Southern Clay & Mfg. Co., Chattanooga, Tenn., street paving brick, including sand foundations and sand material for excavation paving, per sq. yd. \$1.50; Ala. Paving Co., Birmingham, Ala., paving, per sq. yd., \$1.57.

**Jacksonville, Fla.**—For paving Hogan, from Bay to Forsyth Sts.; Laura, from Bay St. to within 105 ft. of Forsyth St., and Forsyth between Main and Ocean Sts.: \*Atlantic Bitulithic Co. for \$6,085.36. The paving is to be done with natural lake asphalt.

**Kissimmee, Fla.**—For construction of the Kissimmee, St. Cloud, Melbourne Highway, involving about 35,000 yds. of brick paving; also concrete curb and concrete bridges, at \$64,910. \*George Engineering Co., Augusta, Ga.

**Savannah, Ga.**—Municipal Board let to \*Southern Paving & Gravel Co., of Savannah, for 500 yds. of gravel at \$1.25 per sq. yd.; \*G. M. Williams & Co., of Savannah, for 5,000 ft. of white oak at \$45 per 1,000 ft.; \*John Rourke & Sons, for thirty meter boxes at \$1.25 for each box.

**Auburn, Ind.**—By the County Comrs., for the construction of four new roads in DeKalb County, two of them being located in Franklin Twp. and two in Union Twp., as follows: J. E. Miller et al. road in Union Twp., known as the Auburn-Newville Rd., concrete and stone construction, let \*N. B. Putman, of Marion, Ind., for \$53,890. Chester Hodge et al. road, known as the Auburn-Waterloo Rd., Union Twp., concrete construction, \*N. B. Putman, for \$24,990. Edson Beard et al. road, in Franklin, Twp., gravel construction, \*A. H. Frey, of Bluffton, Ind., for \$19,500. Jay Keplar et al. road, Franklin Twp., gravel construction, \*A. H. Frey, for \$17,700. Four bids were submitted on the James Sheffler Rd., known as the Auburn-St. Joe highway, to be constructed of brick, but the commissioners have not yet awarded contract. The lowest bid was of Snyder, Harshman & Jarrell, of Frankfort, Ind., \$24,995.

**Evansville, Ind.**—\*J. G. Edmond, of Cypress, Ind., the successful bidder for construction of a Vanderburgh County road on line Pigeon and Knight Twps. \*John Fridy, an Evansville, Ind., contractor, also for roads in this county.

**South Bend, Ind.**—\*Hobal & Roach, for the pavement of Portage Court by the Bd. of Public Works.

**Benham, Ky.**—By Co. Comrs., Harlan, to \*S. H. Stephens, Poorfolk, Ky., at \$20,000, for grading and macadamizing road, 1½ mile long, between here and Poorfolk.

**Jackson, Ky.**—\*J. G. Blanton, Jackson, Ky., for constructing 4 miles of good roads between this city and Quick-sand, at \$60,500, by county.

**Prestonsburg, Ky.**—\*W. M. Garnett, Wayland, Ky., at \$49,800, for macadamizing and reconstructing Main and High Sts. Bids opened Jan. 19 by city.

**Lake Charles, La.**—Commission Council let to \*Richie Bros., for the brick work, and \*De Jersey & Waff, for the reinforced concrete and vibrolithic construction for paving of the following streets: The paving on Miller Ave. and North Ryan St. will be of fiber brick, 2½ in. thick for the former, and 3 in. for the latter thoroughfare. On Kirkman St. the paving will be of vibrolithic; while on Reid and South Division Sts. it will be of reinforced concrete. Table showing the approximate cost per front ft. for each kind of paving on each street based upon said bids. Miller Ave., with a width of 30 ft. to be paved, the estimated cost per front ft. was: brick, 3-in. grout filler, \$3.16; brick, 3-in. asphalt filler, \$3.22; brick, 2½-in. grout filler, \$3; brick, 2½-in. asphalt filler, \$3.12; reinforced concrete, \$2.89; vibrolithic, \$2.76. North Ryan St. with a width of 30 ft. to be paved: Brick, 3-in. grout filler, \$3.10; brick, 3-in. asphalt filler, \$3.16; brick, 2½-in. grout filler, \$3; brick, 2½-in. asphalt filler, \$3.06; reinforced concrete, \$2.83; vibrolithic, \$2.71. Kirkman St., with a width of 24 ft. to be paved: Brick, 3-in. grout filler, \$3.42; brick, 3-in. asphalt filler, \$3.49; brick, 2½-in. grout filler, \$3.30; brick, asphalt filler, \$3.37; reinforced concrete, \$3.10; vibrolithic, \$2.96. South Division St., with a width of 20 ft. to be paved: Brick, 3-in. grout filler, \$2.98; brick, 3-in. asphalt filler, \$3.04; brick, 2½-in. grout filler, \$2.89; brick, 2½-in. asphalt filler, \$2.94; reinforced concrete, \$2.75; vibrolithic, \$2.62. Reid St., with a width of 20 ft. to be paved: Brick, 3-in. grout filler, \$3.06; brick, 3-in. asphalt filler, \$3.10; brick, 2½-in. grout filler, \$2.95; brick, 2½-in. asphalt filler, \$3; reinforced concrete, \$2.80; vibrolithic, \$2.68. The paving for Miller Ave. and North Ryan St. will have grout filler. Grout filler is a mixture of gravel, etc., for filling in the spaces between bricks.

**Flint, Mich.**—For cement to be used by the city during the year ending March 1, to the \*Flint Coal Co., and \*J. P. Burroughs & Son, at \$1.98 per barrel, each to furnish one-half the requirements.

**Zeeland, Mich.**—City opened bids Feb. 1, street paving, brick, 18,582 sq. yds., including concrete foundation, 6-in. thick. Road bed grading, 9,932 cu. yds., \*J. Kloote & Son, Grand Rapids, Mich. D. F. Boonstra, City Clk.

**Stanberry, Mo.**—\*Edgar Main, Liberty, Mo., 3-in. vertical fibre brick pavement,

12,200 sq. yds., including 5-in. concrete foundation; 1,170 yds. earth excavation material, \$1.99 paving per sq. yd.; .49 excavation; total, \$27,426.70. Bidders: Land Const. Co., St. Joseph, Mo., \$28.06 paving per sq. yd.; .50 excavation; \$28,406.36. Lynch & McDonald, Moberly, \$2.00 paving per sq. yd.; .49 excavation; \$27,441.90. E. W. Geiger, Leavenworth, Kan., \$2.03 paving per sq. yd.; .50 excavation; \$27,625.08. Black & Veatch, Engineer, Kansas City, Mo.

**Atlantic City, N. J.**—Contract awarded to Liddle & Pfeiffer, Perth Amboy, at \$693,443, by Atlantic Co. Bd. Freeholders, to pave White Horse Pike from Absecon to Atlantic Co. line, with Warrenite. Annulled Jan. 25 by New Jersey State Supreme Court.

**Brooklyn, N. Y.**—For regulating and repaving portions of (a) Broadway, (b) Hamburg Ave. with granite, (c) Union St. with asphalt, all on 6-in. concrete base. Following are bids received by Pres. Boro. Brooklyn: (a) John J. Towers, 102 Sunnyside Ave., Brooklyn, N. Y., \$24,263; Rosenthal Engr. Contr. Co., 165 Hooper St., Brooklyn, N. Y., \$24,319; Chas. A. Myers Contr. Co., Stag St. and Morgan Ave., \$25,512; Thomas F. Meagher, 230 Jackson St., \$26,019. (b) John J. Towers, 102 Sunnyside Ave., Brooklyn, N. Y., \$28,547; Henry E. Kordes Co., Inc., 243 Moffat St., \$30,209; Chas. A. Myers Contr. Co., \$30,620; Newman & Carey Co., 215 Montague St., Brooklyn, N. Y., \$31,886. (c) Brooklyn Alcatraz Asphalt Co., 407 Hamilton Ave., Brooklyn, N. Y., \$24,804; Borough Asphalt Paving Co., 1301 Metropolitan Ave., Brooklyn, N. Y., \$26,265.

**New York, N. Y.**—For repairing asphalt block pavement and setting curb where necessary in Bronx Boro. Following are bids opened by Douglas Mathewson, pres., Boro. Bronx, 177th St. and 3d Ave., New York City: Hastings Pavement Co., 25 Broadway St., \$10,817; Asphalt Constr. Co., Madison Ave. and 137th St., \$14,965. Furnishing and delivering 9,000 cu. yds. of 1½-in. broken trap rock stone and 3,000 cu. yds. of broken trap rock screenings: New York Trap Rock Co., 17 Battery Pl., \$22,560; New Haven Trap Rock Co., 69 Church St., New Haven, Conn., \$25,080. Furnishing and delivering 325,000 gals. of tar road oil: The Barrett Co., 17 Battery Pl., \$20,480. Furnishing and delivering 800 tons of asphaltic cement: Warren-Quinlan Asphalt Co., Syracuse, N. Y., \$16,240; Standard Oil Co., 26 Bway, \$16,680; Barber Asphalt Paving Co., Woolworth Bldg., \$18,328; Atlantic Refining Co., 3144 Passyunk Ave., Philadelphia, Pa., \$19,224. Furnishing and delivering 450,000 gals. asphalt road oil: Standard Oil Co., \$27,450; Warren-Quinlan Asphalt Co., \$28,575; Headley Good Roads Co., 30th and Spruce Sts., Philadelphia, Pa., \$29,205; J. Baker, Jr., 17 Battery Pl., \$29,700.

**New York, N. Y.**—For grading, setting curb, constructing crosswalks, inlets, receiving basins, drains, culverts, approaches and guard rails where necessary in Ellis Ave. Following are 4 lowest bids opened Jan. 26 by Douglas Mathewson, pres., Boro. Bronx, Municipal Bldg., 177th St. and 3d Ave.: Fred Schneider, Westchester Ave., \$20,999; Oscar Daniels, Woolworth Bldg., \$21,622; DiMenna & Del Balso, 2336 Cambridge Ave., \$22,055; Louis DiMenna, 2435 Southern Blvd., \$23,792. Filling and constructing approaches and guard rails where necessary in Tibbett Ave.: Spadaro Contr. Co., 827 E. 217th St., \$34,955; Watson Contr. Co., 2614 University Ave., \$39,242; Oscar Daniels Co., 38 Park Row, \$40,620; Thos. Crimmins Contr. Co., 444 E. 69th St., \$46,915.

**Ravenna, O.**—Morgan Bros. Ohio St. paving brick 2,300 sq. yds., including granulated slag foundations; 2,000 cu. yds. earth excavation material; paving per sq. yd., \$1.60; excavation, 45 cents; total, \$7,200. S. B. Horsfall.

**Springfield, O.**—Bids opened, City Manager Chas. E. Ashburner, on 9 paving jobs, one macadam project and one sewer system; referred to Chief Engr. M. J. Bahin and the work of tabulating them will start at once. Fred L. Krumholtz, local contractor, estimated on the Ferncliff sewer system, which will relieve the northwestern section of the city; was \$29,000 for the work, which is \$300 under the estimate. It is likely that a recommendation will be made to have the work awarded to him. The approximate estimate on all of the improvements was \$144,000. List of bidders: Paving—Perrin Ave., from Limestone St. to the first alley west of Center St., M. J. Hannon and the Cleveland

Trinidad Paving Co. Elm St., from Chestnut Ave. to Sherman Ave., W. F. Payne, M. J. Hannon and the Cleveland Trinidad Paving Co. Chestnut Ave., from Limestone St. to Elm St., W. F. Payne, J. J. McHugh, M. J. Hannon and the Cleveland Trinidad Paving Co. Sherman Ave., from Mason St. to Murray St., J. J. McHugh, M. J. Hannon, W. F. Payne and the Cleveland Trinidad Paving Co. Sherman Ave., from Murray St. to the bridge over Buck Creek, M. J. Hannon, W. F. Payne, the Cleveland Trinidad Paving Co., F. L. Krumholtz and J. J. McHugh. James St., from Lagonda Ave. to Belmont Ave., W. F. Payne, M. J. Hannon, the Cleveland Trinidad Paving Co., J. J. McHugh and F. L. Krumholtz. James St., from Belmont Ave. to Columbus Ave., W. F. Payne, J. J. McHugh, M. J. Hannon, the Cleveland Trinidad Paving Co., and F. L. Krumholtz. Columbia St., from Center St. to Lowry Ave., M. J. Hannon, W. F. Payne, the Cleveland Trinidad Paving Co. and J. J. McHugh. Lagonda Ave., from Buck Creek to Merritt St., W. F. Payne, J. J. McHugh and M. J. Hannon. Macadamizing and curbing, etc., Burt St. from Kenton St. to Kenwood Ave., J. J. McHugh and Thomas E. Wren. Ferncliff sewer system, F. L. Krumholtz. No bids were submitted on these sewers: High St., from Williams St. to Walter St.; Gothic St., from Edwards Ave. to Catawba Ave.; Middle St., from Warder St. to Nelson St.; Cecil St., from the first alley east of Limestone St. to a point 200 ft. west of Mason St.

**Murfreesboro, Tenn.**—Street paving bids opened Jan. 19, concrete asphalt, 22,800 sq. yds., including macadam foundation, 12 ins. thick. \*West Construction Co., Chattanooga, Tenn., paving, per sq. yd., \$1.14. Paving, \$29,341; concrete, \$9,222.50; excavation included in concrete bid. Total, \$38,563.50. G. B. Gilmer, mayor.

**El Paso, Tex.**—\*El Paso Bitulithic, El Paso bitulithic pavement, including broken stone foundation 4 and 6 ins. thick, having standard \$1.77½ per sq. yd. light standard, \$1.46 per sq. yd.; 50c. excavation. J. N. Galling, City Engr.

**San Antonio, Tex.**—The paving of Army Blvd., \*Uvalde Rock Asphalt Co. The pavement will be of reinforced concrete with half-in. topping of cold-rolled rock asphalt, the price being \$1.47½ per sq. yd.

## SEWERAGE

**Savannah, Ga.**—See "Water Supply." **Decatur, Ill.**—P. T. Hicks, City Engr. City plans intercepting sewers and disposal plant.

**Quincy, Ill.**—City council adopted ordinances for sewers in the territory bounded by Chestnut and Oak and 12 and 14th; estimated cost, \$3,452.44; for sewers in the territory lying between Maine and Hampshire and 24th and 480 ft. east of 25th; cost, \$2,455.64; for sewers between Spruce and Maple and 2d and 9th; cost, \$7,751.69.

**Indianapolis, Ind.**—See "Streets and Roads."

**Indianapolis, Ind.**—The City administration's sewage disposal or White River purification bill was finally completed by City Engineer B. J. T. Jeup and attorneys, and will be introduced in the legislature at once.

**Valparaiso, Ind.**—City is contemplating the construction of a sewer system for the west end. The engineer's estimate on the improvement is \$28,000.

**Des Moines, Ia.**—City to construct and maintain a sewage system in North Highland Park addition.

**Lafayette, La.**—Citizens voted in favor of issuing sewer, water and fire department bonds, \$140,000.

**Hempstead, L. I.**—Assemblyman Thos. A. McWhinney urges sewerage plant. Thinks Nassau County villages could unite to finance garbage disposal scheme. Town board agreed to meet with the assemblyman Feb. 16.

**Wichita, Kan.**—City receiving bids for the construction of Sub-district A of Sanitary Sewer No. 8; 4,390 lin. ft. 8-in. pipe, 18 manholes, 10 observation holes, 3 flush tanks, pump house, List A; pump house, List B; pump house, List C; 800 lin. ft. ¾-in. water pipe; 3 boxes and stop and waste cocks. H. D. Lester, City Clerk.

**Flint, Mich.**—City rejected bids received Jan. 12 for the requirements of sewer pipe or segment block, sizes 27 to 54 ins., for storm sewers. City clerk to readvertise.

**Flint, Mich.**—Petition for a sewer on

10th Ave. from Stone St. west to Begole St., and thence north on Begole St. to the north side of lot 52, Vineland, was referred to the sewer committee.

**Flint, Mich.**—Citizens voted for construction of storm water sewers and sanitary sewer a \$278,559 bond issue.

**Pontiac, Mich.**—City granted petition property owners on Moreland Ave. to construct a lateral sewer from Lot 12 to Lot 32 of the Oakland Heights addition.

**Albert Lea, Minn.**—Plans being made by city for sewers in Ramsey, Minnesota, Freeborn, Pillsbury, Johnson, Bridge and Sheridan Sts. and Marshall Ave. C. J. Dudley, City Clerk.

**Halstead, Minn.**—Sewer system contemplated by village. A. O. Utland, village clerk.

**St. Cloud, Minn.**—Comr. Henry Maybury's report covering a program of improvements to be made and completed during the year: Sewers—Drainage of territory north of St. Germain St. and west of the Osseo tracks and all other property affected by water from the said territory. Seventh St. southeast, from Wilson Ave. to 7th Ave. southeast, and on 6th Ave., southeast, from the Sherburne County line to 7th St. southeast. Ninth Ave. south, from 5th St. to 9th St. south. Tenth and ½ Ave. south, from 13th St. to 12th St.; 12th St., from 10th Ave. to 9th Ave.; 9th Ave. from 12th St. to 12th St. In the alley, between 3rd and 4th Aves., from the manhole in Block 28 to the center of Lots 9 and 3 in Block 27, Curtiss survey. St. Germain St. west from 16th Ave. to Metzroth Pl. Lowering and extension of sewer in alleys situated in Blocks 23 and 31, Curtiss survey. Storm Sewers: Paving District—Fourth Ave. south, from 2nd St. to the ravine. Fourth Ave. south, from 6th St. to the ravine. Third St. south, from 5th Ave. to 3rd Ave. Fourth St. south, from 5th Ave. to Fourth Ave. Fifth St. south, from 5th Ave. to 4th Ave. Sixth St. south from 5th Ave. to 4th Ave. On 6th St. from 3rd Ave. to 2nd Ave. south. Second Ave. from 5th to 6th St. Fifth St. from 2nd Ave. to 1st Ave. First Ave. from 6th St. to 4th St. Fourth St. south, from 2nd Ave. to the Mississippi River. Sewer and Water Connections: In the Paving District—Fifth Ave., from 2nd St. to 7th St. south. Third Ave., from 1st St. to 7th St. south. Seventh St. south, from 5th Ave. to 1st Ave. First St. south, from 3rd Ave. to 4th Ave. south.

**Chillicothe, Mo.**—The city attorney and city engineer were authorized by the City Council to secure the right-of-way for the extension of the Jackson St. sewer. The sewer will join the Swift sewer southwest of the city. The extension is about 1½ mile.

**Big Sandy, Mont.**—Sewer bonds of \$12,500 will be sold by Town Clerk. Hans H. Lehfeldt, March 1, at 2 p. m.

**Elko, Nev.**—The question of issuing a \$15,000 sewer system bond considered by city.

**Reno, Nev.**—A bill will be introduced in the legislature in the near future compelling the city of Reno to issue bonds for \$150,000 to build a sewage disposal plant to care for the sewage. City Engineer Chism.

**Bayonne, N. J.**—Ordinance introduced to Board of Commissioners to construct west of Ave. C. easterly to Ave. C. Wm. P. Lee, City Clerk.

**Trenton, N. J.**—City approved an ordinance to authorize the construction of sewer No. 671 in Lenape and Edgewood Aves. Fredk. W. Donnelly, Mayor; Leop. D. Hirsch, City Clerk.

**Brooklyn, N. Y.**—The Glendale Park Construction Company, Inc., has been organized by a group of citizens interested in the development of that section of the Borough of Queens. The object is to build sewers in Emerson Ave., Dry Harbor road, Park View Ave., Hamson Ave., Ford Ave., Brush St., Deyo St., Walton St., and Varian place, to be connected with the new trunk sewer just completed in Central Ave.

**Niagara Falls, N. Y.**—City will receive bids Feb. 8 for the \$192,000 bond issue for sewers.

**Oswego, N. Y.**—C. W. Linsley, Comr. Dept. Pub. Wks., receiving bids for about 6,800 lin. ft. of 6 to 12-in. vit. tile sewers with "Y" branches, fanholes, catchbasins, etc.

**Peekskill, N. Y.**—Peekskill Savings Bank was the successful bidder for \$11,795.63 sewer bonds at a premium of \$95.

**Cleveland, O.**—An ordinance was passed by City Council to issue \$500,000 bonds for sewerage various streets. R. Hoffman, City Engr.



**Marion, O.**—Plans made by city for sewer in West Center St. H. H. Woyer, City Engr.

**Massillon, O.**—See "Streets and Roads."

**Stryker, O.**—Village made plans for sanitary sewers. Y. Champe, Toledo, Engr.

**Toledo, O.**—Plans for Toledo sewage relief were carried before the cities committee of the state house of representatives. County Sanitary Engineer L. A. Boulay appeared before the committee to urge passage of the Evans sewer bill. It applies ultimately to the whole Lucas County sanitary sewer plan, and immediately to the Maumee sewage relief. The bill would allow Maumee village to connect with the Broadway sewer for 20 years, removing sewage from the Maumee river, above the city, to protect the city water supply. It would permit the county to contract with the city for joint use of sewers. W. H. Dittoe, chief engineer of the State Board of Health, champions the measure. Senator Benedict introduced the same bill in the senate.

**Worthington, O.**—For about \$10,000, ordinance passed by City Council for sanitary sewers.

**Carnegie, Okla.**—To build sanitary sewers, \$25,000 bond issue voted by citizens. Benham Engineering Co., Colcord Bldg., Oklahoma, Engr.

**Lindsay, Okla.**—City will shortly vote \$30,000 bond issue for sanitary sewers.

**Erie, Pa.**—Work will be started early this year on a storm water sewer system to drain practically all of the west side from the railroad tracks to the lake. Cost of the improvement is estimated at \$62,798.35 by City Engineer F. G. Lynch, who furnished City Solicitor H. B. Duff with data for an ordinance covering the work. The sewer will be constructed in three sections. The first section will be a concrete culvert 4 ft. by 5 ft. from the outlet at the bay shore 140 ft. south in Myrtle St.; then with 40-in. reinforced concrete pipe for 155 ft. to a point 20 ft. north of Front St., including necessary manholes. The second part will extend with two lines of 36-in. tile pipe south in Myrtle to 8th St.; then west through 8th St. with 24-in. pipe to Chestnut St. The third section will extend from 8th St. through Myrtle St. with two lines of 30-in. tile pipe to 12th St. Although plans at present do not show it, it is also proposed to extend the line west in 12th St. as far as Cherry St. to drain the west side subways as they are completed. Street Director W. D. Kinney hopes to have the bill ready for introduction within a week, and as soon as it is passed the city engineer will invite proposals for construction. The money will be derived from the sale of \$70,000 worth of storm water sewer bonds authorized last year.

**Harrisburg, Pa.**—Among the permits and decrees issued by the Pennsylvania Department of Health relative to Sewerage, during the period from January 1st to 31st, 1917, inclusive: Pulaski Twp., Lawrence Co. (Sisters of the Holy Humility of Mary, Inc.)—sewerage and sewage treatment, January 4th; Philadelphia, sewer extensions, January 11th; Clarion, approving plans for district and sanitary sewer system and intercepting sewer, January 12th; Punxsutawney, approving district sanitary sewers, outfall sewer and sewage treatment plans, January 12th; Coatesville, approving plans for lateral sanitary sewer extensions and sewage disinfecting apparatus, January 23; Archbald, approving comprehensive sanitary sewerage plans, January 31; Taylor, approving comprehensive sanitary sewerage plans, January 31; Tyrone Twp., Perry Co., County Commissioners (Almshouse), approving plans for sanitary sewer system and sewage treatment plant, January 31st; Tyrone Twp., Perry Co. (Tressler Orphans' Home), sewerage and sewage treatment, January 31st; Vandergrift, approving plans for comprehensive sanitary sewer system and preliminary plans for sewerage treatment, January 31st.

**Hazleton, Pa.**—Dr. Samuel Dixon, head of the state Department of Health, has notified the local city commissioners that the state health department refuses to approve the plans submitted for the comprehensive system of sewers for this city. Profiles and other detail data must be submitted to the department.

**Johnstown, Pa.**—See "Streets and Roads."

**Media, Pa.**—For about \$300,000, sewer system and disposal plant considered by Comrs. Upper Darby and Haverford Twp.

**Middletown, Pa.**—Borough citizens discussed the proposition for the paving of Main St. from Nissley St. to the Swatara Creek. A resolution was adopted asking the state to appropriate its share of the cost of the paving. Because the street is on the line of the state highway, the state would pay one-half the cost, the county one-fourth, leaving the other up to the taxpayers along the street. It is estimated that it would cost from \$1.25 to \$1.75 to pave the highway.

**Philadelphia, Pa.**—See "Water Supply."

**Penns Station, Pa.**—Messrs. Lyon, Singer & Co., Pittsburg, successful bidders for sewer and paving \$25,000 bonds.

**West Chester, Pa.**—For sewerage pumping station north end Boot Rd. and east North Franklin St.; plans being made by borough.

**Wilkes Barre, Pa.**—State department of health granted permission to the Hanover Township authorities to locate the sewage disposal plant on strip of territory between the Carey Ave. and the new Plymouth bridge.

**Providence, R. I.**—The finance committee has approved the \$50,000 loan for the construction of a sewer in Shove St. A bill is pending before the Legislature for the loan and a committee from the board will be instructed to advocate its passage when the hearing is held.

**Clear Lake, S. D.**—Citizens voted a \$25,000 bond issue for sewer system.

**Jackson, Tenn.**—City at an election Mar. 8 will vote on a \$40,000 bond issue for sewerage extension.

**Nashville, Tenn.**—To improve system city plans a bond issue of \$1,535,000. W. W. Southgate, City Engr.

**El Paso, Tex.**—The necessity for compliance with a new Texas law that prohibits cities from polluting streams, which will go into effect next July, will oblige this city to construct a \$100,000 sewage purifying plant within the next few months. Having no such equipment at the disposal plant, which was built for incinerating garbage of the city only, the council proposes, with proceeds of the sale of bonds voted at the December election, to build a section of septic tanks between the disposal plant just west of Washington park, through which the sewage will be moved, finally purified. Sewer department officials are investigating the Imhoff system, which is used in many of the large cities of this country, as well as in Germany and France, and may decide to erect a plant of that kind. Dallas is now building an Imhoff plant to cost \$500,000 and Houston, Amarillo, Fort Worth, Texarkana and Cleburne are said to be in favor of adopting the system. The Imhoff method of handling sewage is designed to eliminate solids for fertilizer and for incineration so that the water in the sewage, which represents the bulk of the flow, may be discharged into a stream practically pure.

**Richmond, Va.**—Draft of the ordinance prepared by the city attorney to allow the Richmond, Fredericksburg & Potomac Railroad Co. and the Richmond Terminal Co. to construct and maintain a sewer across Railroad Ave. and Heritage Rd. was approved by the administrative board and forwarded to the City Council with the recommendation that it be adopted.

**Green Bay, Wis.**—City Council granted petitions for sewers on St. Claire St. from Irwin to Baird; on Chicago from Baird to Godell; on Kurtz Ave. from Crooks St. to East River; on South Chestnut Ave. from 10th to Prospect; on Norwood from Mason to Green Bay Railway tracks; on Stuart from Irwin to East River.

**Dundas, Ont.**—Murray & Lower, 186 King St., W. Toronto, preparing plans for trunk sewers, cost \$56,000.

**Hamilton, Ont.**—City Engineer E. R. Gray has advocated an expenditure of \$20,000 for the Birch Ave. extension, repairs to brick sewers and estimates for a storm sewer.

**Toronto, Ont.**—For the pumping of sewage outside the city R. C. Harris, Works Commissioner, reported that it would require \$5,000.

**Welland, Ont.**—Geo. Ross, engr., estimates the cost of constructing a sewer to drain 5th and 6th Sts., at \$2,550.

**Montreal, Que.**—The Board of Control decided to have consulting engineers report on the cost of three sections of the Notre Dame de Grace sewer. City engineer, Paul E. Mercier.

## BIDS RECEIVED AND CONTRACTS AWARDED.

(\*Indicates Contracts Awarded.)

**Los Angeles, Cal.**—Board of Pub. Works opened bids Jan. 22, for the following work: A vitrified pipe sanitary sewer in Slauson Ave., from Fortuna St. to the southerly prolongation of the center line of Encino St., and in portions of Encino St., Compton Ave., Fortuna St., first alley west of Encino St., first alley east of Encino St., first alley north of Slauson Ave., and in a sewer right of way to \*Andrew Javich. \$2,054 for sewer complete. Horace B. Ferris, Secretary.

**Alton, Ill.**—\*Myers Construction Co., St. Louis, Mo., constructing trunk sewer in Shield Branch Sewer District, at \$124,023.

**Dunkirk, Ind.**—\*Sprinkle & Frost, Portland, Ind., for constructing 2,400 ft. of 6, 8 and 10 in. sewer on Washington and Angle Sts., at \$1,684.

**Lenox, Ia.**—For sewage system consisting of laterals, outfall line and septic tank, \*Morrison Construction Co., Des Moines, Ia. Robert H. Hammond, Consulting Engineer, Creston, Ia.

**Baltimore, Md.**—For vitrified sewer pipe for highway engineer's dept., at \$11,000 by city to Pen-Mar Construction Co., 521 Munsey Bldg., Baltimore. \*United States Cast Iron Pipe & Foundry Co., Morris Bl., Philadelphia, Pa., for 6 months' supply of c. i. fittings for water department, at \$106,375.

**Lansing, Mich.**—\*Fisher & Noyce for the construction of a sewer in Kalamazoo, Francis and Mifflin Sts., for the sum of \$3,399.78.

**Lansing, Mich.**—\*Fisher & Noyce for the construction of sewer in Margolia Ave., at \$1,162.36.

**New York, N. Y.**—For alterations and improvements to 11th street sewer, \*Laconia Constr. Co., 835 E. 213 St., \$15,942; Bidders, Jos. E. Buckley, 202 E. 90th St., \$16,204; Briggs & McLaughlin Constr. Co., 334 E. 134th St., \$17,095; Melrose Constr. Co., 145 E. 125th St., \$17,917. Pres. Boro. Manhattan.

**Cleveland, O.**—\*G. D. Hoag, 1844 E. 87 St., Cleveland, at \$16,994 for Turney rd. outlet sewer, and to \*Wm. McDowell 10,505 Miles Ave., Cleveland, for discharge sewer. Let by Village of South Newburgh, Herman Behring, Village Clk.

**Springfield, O.**—See Streets and Roads.

**Halifax, N. S.**—For the construction of the section of the Arm intercepting sewer between Oxford St. and Oakland Rd., Bd. of Control, acting on the report of Acting Engineer H. Johnston, recommended for acceptance the tender of the \*Cook Construction Co., Limited, and \*Wheaton Bros., at \$68,000.

**Dallas, Tex.**—City Commission also adopted the recommendation of Commissioner A. C. Cason that the contract for the sanitary sewer on Sixth street, Oak Cliff, from Beckley to Marsalis, be awarded the \*Dallas Lime and Gravel Company at \$1,486.90.

**Milwaukee, Wis.**—\*O. Henry Bossett, Milwaukee, for a 54-inch sewer in 40th St., from the Water town plank road to Chestnut St., \$28,304.50.

## WATER SUPPLY.

**San Francisco, Cal.**—City Engineer M. M. O'Shaughnessy in his annual report requests \$11,000,000 to be derived from the sale of bonds by the city treasurer to provide funds for carrying on the work of the Hetch-Hetchy water supply project during the present year.

**Bristol, Conn.**—A pumping engine to supplement the present fire fighting equipment will be bought within a year or two according to the opinion now held by city officials conversant with the needs of the fire department.

**Hartford, Conn.**—Center fire district of West Hartford voted to appropriate \$800 for installation of additional hydrants and incidental needs; also voted to borrow on short term notes to finance the matter, a sum not to exceed \$12,000.

**Savannah, Ga.**—Water Committee of Council plans to spend approximately \$10,000 for extending water mains and making connections with the sewerage system.

**Joliet, Ill.**—The city council has de-

cided to lose no time in the electrification of the main pumping station of the water works, in East Washington St., estimated to cost, with certain improvements to be made at approximately \$25,000. Pumping machinery and other equipment needed in the line of electrification are to be three pumps, one of 1,000,000 gallons capacity, one of 2,000,000, and one of 3,000,000. They are each a single-stage, double suction, horizontally split case type of centrifugal pump, with 105 ft. of head. The 1,000,000 gallon pump is to be coupled to a 30 h. p. three-phase 60-cycle, 4,000 volt, slip-ring type of induction motor. The 2,000,000 gallon pump is to have a 60 horse power motor of the same type, and the 3,000,000 gallon pump a 100 horse power motor. Bids are called for the work.

**Fort Dodge, Ia.**—City considering plans for an electric pumper. Mayor J. F. Ford.

**Lafayette, La.**—See "Sewerage."

**Fitchburg, Mass.**—City council authorized board of water commissioners to construct a compensating reservoir at cost of \$19,656. Reservoir is for the purpose of the reduction and liquidation of damages that would otherwise result to mill owners on the Squannacook River and Willard Brook by reason of the taking and diverting of the waters of Ashby reservoir. Thomas C. Sheldon and Arthur A. Train, Water Comrs.; Walter A. Davis, City Clerk.

**Framingham, Mass.**—Water extension notes of \$10,000 will be sold Feb. 12 at 5 p. m. Town Treasurer, Herbert E. Stone.

**Birmingham, Mich.**—Water works bonds of \$7,788 purchased by Messrs. John F. McLean & Co., Detroit.

**Flint, Mich.**—Petitions for water mains on Chippewa and Root Sts., from Pater-son St. to Witherbee St., and on 10th Ave., from Stone St. to Begole St. and thence north on Begole St. to the north side of lot 52, Vineland, were referred to the water board.

**Flint, Mich.**—Citizens voted \$66,150 bond issue for the extension of water mains.

**Lake Linden, Mich.**—Village Council plans water mains.

**Pontiac, Mich.**—Commission will receive bids for the purchase of bonds, par value \$210,000, being the first \$210,000 of an authorized issue of \$275,000 for improvement and extension of the water works system of said city.

**Duluth, Minn.**—Improvements in the water and light plant as recommended by the National Board of Fire Under-writers to raise Duluth's insurance grade from third to second class are approved by D. A. Reed, manager of the department, in his annual report. Construction of a 20,000,000-gallon high pressure reservoir; duplication of the supply line leading from the main reservoir at 34th Ave. east; increase in the number of gate valves throughout the city; construction of a high pressure system in the congested valve district; reduction of hydrant spacing in congested valve district to 250 ft. and in residence districts to 350 ft. Manager states that work is now progressing on the duplicate supply main, about one-third of a mile in length, to be completed this winter. It will eventually be extended through to 15th Ave. east, a total distance of two miles from the reservoir at 34th Ave. east.

**Hancock, Minn.**—An election to issue \$6,000 water works bonds will be held shortly.

**Plainview, Minn.**—Village receives bids in spring water system. J. F. Druar, 312 Commercial Bldg., St. Paul, Consulting Engineer.

**St. Cloud, Minn.**—Commissioner Henry Maybury's list of improvements to be made during the year: Water Mains—On 1st Ave. northeast, from St. Germain St. north to the Great Northern right-of-way. 9th Ave. south, between 9th and 10th St. south. McKinley Place north, between St. Germain St. and 2nd St. 2nd Ave. south, between 8th and 9th Sts. south. On 10th and 1/2 Ave. south, from 13th St. north, one block to 12th St., thence east one block to 9th Ave., thence north one block to 11th St.

**St. Cloud, Minn.**—Commissioner Henry Maybury in his report shows that in addition to the new work several improvements ordered last year will be installed. Includes the white way on St. Germain St. from Fifth Ave. to the Northern Pacific station and the water mains on Wilson Ave. northeast, from St. Germain St. to Fifth St. northeast, on 2nd St. northeast from Second Ave. to Third Ave. and on Third St. from

Third Ave. to Wilson Ave., and on Fifth St. northeast from Wilson Ave. to Fourth Ave. northeast.

**West Concord, Minn.**—To prepare plans for a water works system to include a 50,000 gallon steel tank, an engineer has been engaged to prepare plans.

**Big Sandy, Mont.**—Water works bonds of \$16,800 will be sold March 1 at 2 p. m. Town Clerk, Hans H. Lehfeldt.

**Dover, N. J.**—To assist Dover in obtaining an additional water supply and equipping a storage reservoir the present legislature will be asked to pass a law permitting the bonding of the town for this purpose in the sum of \$500,000 instead of \$300,000, the limit now.

**Attica, N. Y.**—To purchase plant Attica Water, Gas & Electric Co. city voted \$53,000 bonds; to improve and extend, \$43,000. W. L. Hopkins, City Clk.

**Danville, N. Y.**—City considers plan to appropriate \$12,000 bond issue for new water supply.

**Syracuse, N. Y.**—Supt. Chas. A. Windholz of the bureau of water and Deputy City Engineer Marshall B. Palmer held a conference on the construction of a 12-in. water main across Onondaga Creek at West Taylor St. A bridge across the creek at West Taylor St. is now being built and the water main probably will be carried across the stream suspended under the bridge.

**Lumberton, N. C.**—Bids received Feb. 21, noon, water and light improvement bonds, \$151,000. Ira B. Townsend, Clerk and Treasurer.

**Winston-Salem, N. C.**—See "Sewerage."

**Akron, O.**—February 14 Dir. Pub. Serv. receiving bids 2 water-tube boilers, 300-h.p. each, to be installed in Cuyahoga River Pumping Station. H. H. Frost, Supt. Water Works.

**Bellaire, O.**—City council has authorized the issuance of \$25,000 water works bonds.

**Canal Winchester, O.**—For water works, \$18,000 bonds, the Ohio National Bank of Columbus successful bidder.

**Canton, O.**—Council approved Mayor Stolberg's recommendation to have low lift pumps and a receiving basin of a million gallons capacity installed as part of the central water works station equipment. Will make it possible to provide to a certain extent for reserve pumping equipment. Mayor is having plans and estimates prepared at once and this improvement, together with plans for a sub-pumping station and more wells north of town, will be pushed as fast as possible.

**Canton, O.**—City council will submit to the voters a \$250,000 bond issue for the construction of a reservoir.

**Cleveland, O.**—An ordinance passed by city council to issue \$500,000 bonds to install waterworks. R. Hoffman, City Engr.

**East Youngstown, O.**—February 24th, city will vote to install water system a \$45,000 bond issue.

**Salem, O.**—At an estimated cost of \$6,000 Service Director Russell plans in the future to install electrical equipment in the pumping station.

**Maysville, Okla.**—City plans to improve waterworks.

**Tablequah, Okla.**—A Kansas City company has been employed to prepare plans for a system of water works. Bonds were recently voted for the construction of the system.

**Wewoka, Okla.**—City voted \$47,000 bonds to improve waterworks.

**Harrisburg, Pa.**—Among the permits and decrees issued by the Pennsylvania Department of Health relative to waterworks during the period from January 1st to 31st, 1917, inclusive. Aston Twp., Delaware Co. (Aston W. Co.)—approving new system with filtered supply; January 4th Chester (New Chester W. Co.)—approving plans for filtration plan, January 4th; Franklin, approving additional drilled well supply, January 4th; North Buffalo Twp., Armstrong Co., Cadogan VII. (Allegheny River Mining Co.)—approving plans for filtration, January 4th; Upper Chichester Twp., Delaware Co. (Upper Chichester Water Co.)—approving new system with filtered supply, January 4th; East Franklin Twp., Armstrong Co., Furnace Run Village, No. 1 (Allegheny River Mining Co.)—approvin' plans for filtration, January 12th; Mohnton (Mohntonville Water Co.)—approving plans for filtration, January 18th; Ringtown, approving plans for waterworks, January 18th; Rimersburg, approving additional drilled well supply, January 25th; Woodlawn (Woodlawn Water Co.)—approving plans

for additional pumping equipment and reservoir, January 26th; Smith Twp., Washington Co. (Langeloth Townships Co.)—approving plans for filtration, January 31st.

**McKeesport, Pa.**—Messrs. Holmes, Bulkley & Wardrys, of Pittsburgh, successful bidders for \$90,000 water bonds. C. E. Soles, City Controller.

**Murray, Pa.**—Light and water bonds to the amount of \$20,000 were rejected. C. M. Smoot, City Clerk.

**Philadelphia, Pa.**—For laying parallel water mains from Torresdale filtration plant to the business section, and for other water works improvements, Mayor Smith is advocating an expenditure of \$6,000,000 to \$7,000,000.

**Philadelphia, Pa.**—A special election will be held April 10 to vote on the question of issuing city bonds in an amount between \$8,000,000 and \$9,000,000, as follows: Supplemental water supply system, \$3,000,000; convention hall deficit, \$1,500,000; sewers and opening, grading and paving of streets, \$2,000,000; bridges, including \$400,000 for the Henry Ave. bridge, \$1,000,000; Cobb's Creek Parkway improvements, \$150,000; mandamus for municipal court salaries, etc., and awards to property owners for damages, etc., \$500,000.

**Quarryville, Pa.**—Rather than install a new system taxpayers have voted to purchase local plant.

**Dallas, Tex.**—The city has arranged for the purchase of \$55,000 worth of city bonds for immediate delivery, announced by Finance Commissioner Manning B. Shannon. The bonds to be retired are as follows: One crematory, \$1,000; 25 water works improvement bonds, \$25,000; two street improvement bonds, \$2,000; seven sewage disposal bonds, \$7,000.

**White Salmon, Wash.**—To purchase the local waterworks system the proposition will shortly be submitted to the voters. H. L. Douglas, Mayor.

**Strathroy, Ont.**—Work to start in the spring on enlarging the water supply system. Clerk, F. W. Atkinson.

#### BIDS RECEIVED AND CONTRACTS AWARDED.

(\*Indicates Contracts Awarded.)

**Savannah, Ga.**—See Streets and Roads.  
**River Forest, Ill.**—Guy McClintock Co., 246 Lake St., Oak Park, Ill., for water works improvements, comprising concrete foundation & fl. pipe fittings, etc., at \$7,000. Village council, J. T. Mair, Pres.; W. M. McMann, Engr., Karpen Bldg., Chicago.

**Dakota City, Ia.**—Des Moines Bridge & Iron Co., Ninth and Tuttle Sts., Des Moines, water tower, 8 tank pumps, \$2,000 ft. cast iron pipe, \$16,000. Engr., L. W. Cox, 1316 E. 12th St., Des Moines, Ia.

**Manhasset, L. I.**—Water Comrs. of Albertson Square Water District, to W. G. Fritz, of Milford, N. J., for constructing the water system of the district. The sum of \$35,000 will be asked to complete the job. The Supvr. has advertised the bonds for this improvement to be sold on Feb. 14.

**Pontiac, Mich.**—Commission awarded \*William Maddock for the addition to the water works. \*American Cast Iron Pipe Co. and \*Crane & Co. for iron pipe and galvanized iron pipe. Plan prepared by Fisher Bros.

**Milwaukee, Wis.**—Bids were opened in the department of public works for 152 water valves to be used by the water department. The price on valves of five different designs overages about \$17.10, according to figures quoted by the lowest bidder.

**Toronto, Ont.**—Board of Control to the \*Godson Contracting Co. for the construction of a 12-inch water main on Queen St., from Pape Ave. to Leslie St., at \$2,375.

**Texarkana, Ark.**—Mayor Sanderson introduced to the city council, on the Arkansas side the question of a new city hall. Preliminary steps were taken looking to the building of a new city hall, to be a two-story affair, commodious and modern in all respects, and the estimated cost of which will be about \$75,000. The present building is to be repaired at once. It will be used exclusively as a fire house after the new city hall is completed. Mayor Runnels stated that it was probable arrangements would be made in a very short time to build a new city hall on the Texas side, the cost to be between \$75,000 and \$100,000.

**Texarkana, Ark.**—City council authorized the purchase of a new 5-passenger car for the police department, with instructions to turn the old one in on trade.



**Washington, Ark.**—Commissioners of Ozan drainage district No. 2, of Hempstead county, Arkansas, will accept sealed bids at the office of Etter & Monroe, in the town of Washington, Hempstead county, Arkansas, at 1 o'clock p. m., on Feb. 15, for \$56,000 in bonds of said district at 5½ per cent. interest, for 1 to 16 year bonds, in denominations of \$500, interest payable semi-annually.

**San Diego, Cal.**—The house of representatives of congress passed a bill appropriating \$105,000 for dredging that part of the harbor north of the municipal pier to a depth of 32 feet, to cost \$85,000 and \$20,000 is to be for maintenance.

**San Francisco, Cal.**—A municipal railway line up Market St. from the ferry to Sloat Blvd. through the Twin Peaks tunnel and the connection of the completed Church St. line with it, was authorized by the public utilities committee of the board of supervisors. It will entail altogether an expenditure of \$655,000 as follows: Kearny and Market to Van Ness Ave. and Market, \$250,000; Van Ness Ave. and Market to Church and 16th Sts., \$110,000; Church and Market Sts. to the mouth of Twin Peaks tunnel, \$82,000; through the Twin Peaks tunnel to Sloat Blvd., \$213,000.

**Washington, D. C.**—Bureau of Foreign and Domestic Commerce (Dept. of Commerce)—A man in Spain desires to receive estimates on the cost of installation and maintenance of various methods of transporting 150 to 200 tons of mineral ore per day a distance of 6 miles on bad roads, with a short grade of about 3 per cent. The cost of coal is \$22 per ton and gasoline about 84 cts. per gal. He will consider an aerial tram, motor trucks with trailers, or a small railway. Quotations should be made c. i. f. destination. Correspondence should be in Spanish. Refer to Opportunity No. 23611.

**Washington, D. C.**—Bureau of Foreign and Domestic Commerce (Dept. of Commerce)—A firm in Norway is in the market for construction materials such as roofing material and round irons for reinforcing concrete. Quotations should be made c. i. f. destination or f. o. b. New York. Cash will be paid. Correspondence may be in English. Reference. Refer to Opportunity No. 23616.

**Jacksonville, Fla.**—Citizens at special election March 8 will vote on the proposition of the Gulf, Mobile & Northern R. R. Co. for this city to subscribe to \$100,000 of the stock of the railroad company, issuing bonds of the city to that amount for the payment.

**St. Augustine, Fla.**—Chief of Police Quigley in his annual report recommends that the city jail be strengthened by installing a new 6-cell steel cage of modern design; also installing modern and reliable police call boxes.

**Sullivan, Ill.**—Council discussed buying a new street sweeper for city use.

**Terre Haute, Ind.**—Commissioners of Vigo and Sullivan counties met in joint session here and decided upon a bond issue of \$37,318 for the construction of the Prairie Creek drainage ditch, which will run between the two counties. Vigo will issue bonds for 94 per cent of the ditch, that proportion being in this county. The ditch is being built as the result of the efforts of the Prairie Creek Levee Association.

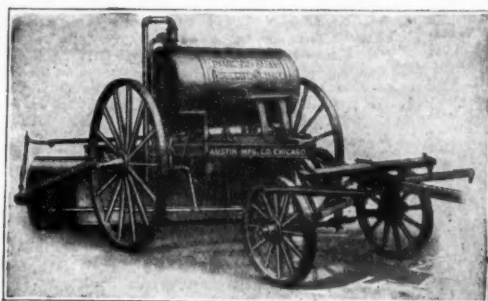
**Des Moines, Ia.**—Councilman John W. Budd will purchase an oiler, a motor-flusher and an extra sweeper. The motor-flusher will be so constructed that the tank can be removed and a snowplow made of the vehicle in the winter.

**Topeka, Kan.**—A bill authorizing the city of Lawrence to provide protection for the Bridge Street fill north of the Kaw river at Lawrence was introduced in the house by Cummings of Douglas county. It authorizes the city to construct jetties and do whatever is thought necessary; also introduced an appropriation bill asking \$1,886 for the Maple Grove Drainage district in Douglas Co.

**Covington, Ky.**—Tundray bonds to the amount of \$140,000 purchased by Messrs. Field, Richards & Co., of Cincinnati; premium of \$1,603.34. Lew L. Applegate, City Recorder.

**Annapolis, Md.**—Board of Public Works for the issue of \$600,000 bonds, part of the three million dollar loan authorized by an act of the Legislature of 1916, to the Equitable Trust Company, of New York, at its bid of 102.127.

**Cumberland, Md.**—Commissioner of Finance and Revenue, Keyser was authorized by city council to have and offer for sale Feb. 19, 10 a. m., bonds to the amount of \$300,000 as the first install-



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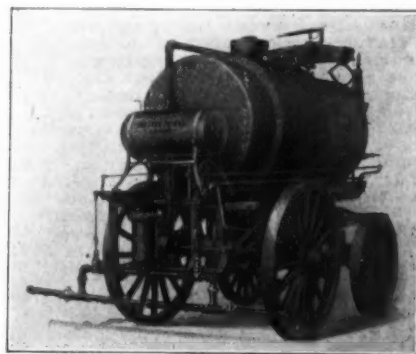
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ment of the \$500,000 general improvement bonds authorized at the special election on October 5, 1916.

**Beverly, Mass.**—Mayor's recommendation appropriating \$600 for the purchase of a 50 horse-power electric motor for use at the stone crusher was adopted under suspension of all rules and the commissioner of public works was given authority to purchase the motor without advertising.

**Fall River, Mass.**—Temporary loan of \$200,000 purchased by Messrs. Harris, Forbes & Co., of New York.

**Duluth, Minn.**—The council passed the ordinances appropriating \$10,920 for road oil; \$1,800 for cloth for patrolmen's uniforms.

**Fayette, Miss.**—For town bonds of \$5,000, Town Clerk E. H. Reber, will receive bids Feb. 6, at 8 p. m.

**Passaic, N. J.**—Throughout this section of the State, from officials, organizations and individuals, with reference to the elimination of the dangerous grade crossing of the Newark-Pompton Turnpike on the Lackawanna Railroad at

Mountainview, at a public hearing held at the instigation of the Passaic County Board of Freeholders in the county courthouse at Paterson showed without exception all to be in favor of the elimination.

**Binghamton, N. Y.**—Chenango Valley Savings Bank of Binghamton purchased the \$50,000 police department bonds at a premium of \$1,050 less 102.10, a basis of 3.74 per cent. Harry H. Evens, City Controller.

**Binghamton, N. Y.**—Common Council approved plans of city engineer Weller to remodel the Washington St. School for a new police station and the City Hall, to provide more office room.

**Binghamton, N. Y.**—Binghamton probably is to have a public market next summer. It will be established either in Wall St. along Tyler Park front, or else on the site now occupied by the buildings formerly used by the Water Department in Water and Washington Sts.

**Bronxville, N. Y.**—Village Clerk Frank Dinsmore will receive bids Feb. 13, at 8 p. m., \$50,000 Grade Elimination bonds.

**Springfield, Mass.**—Superintendent of streets and engineering, Fred H. Clark, requests finance department for an appropriation of \$15,100 for the purchase of automobiles for use in connection with the work of the streets and engineering department.

**St. Paul, Minn.**—Resolutions asking the city council to petition the legislature for authority to issue bonds in a sum not to exceed \$500,000 for river and harbor development purposes were adopted by the directors of the St. Paul Association on recommendation of its river and harbor committee.

**Fairport, N. Y.**—Bids received Feb. 23, at 7 p. m., by Village Treasurer Geo. Y. Mulliner, \$25,000 drainage bonds.

**Johnstown, N. Y.**—City Chamberlain Eldridge sold the seventy-eight public improvement bonds, of the denomination of \$100 each to the Albany Exchange bank on the basis of 4.05, which makes the premium \$7,952.05. Bidders were: Adams & Co., of New York, offered \$7,910.76; H. A. Kahler & Co., of New York, \$7,881.90; John J. Hart, of Albany, \$7,871.76; Isaac W. Sherrill Co., of Poughkeepsie, \$7,867.86; Crandell, Sheppard & Co., of New York, \$7,856.16, and George B. Gibbons & Co., of New York, \$7,813.26.

**Little Falls, N. Y.**—City may purchase a street flusher.

**New York, N. Y.**—Several merchants in the 6th Ave. district above 34th St. formed a Sixth Ave. Association. J. Irving Murray, of the William R. Jenkins Co., was elected permanent chairman, and Louis Jantzen treasurer. One step toward the improvement of the thoroughfare was voted to request the Interborough Co. to repaint the elevated structure between 34th and 58th Sts. Committees were appointed to take up the subjects of getting better lighting facilities and prompt removal of garbage.

**Yonkers, N. Y.**—The New York Central Railroad Co. has submitted to City Engineer Daniel Fulton four different plans for the elimination of the grade crossing on Yonkers Ave. at Dunwoodie station. This is on the main line of the Putnam division. The cost is estimated by the railroad at from \$155,000 to \$285,000, according to which plan is taken. The city will bear one-fourth of the cost and the state one-fourth, with the remaining half being paid by the railroad. Subway—street detoured and narrowed to 56 ft. Subway—on present street lines, but street narrowed to 65 ft. Viaduct—street greatly detoured and narrowed to 56 ft. The city engineer has requested the New York Central Railroad Co. to submit detailed estimates of the costs. He will also make approximate estimates of the costs of the various schemes. If agreement can be reached between the railroad company and the city, as to the plan best suited to the interests of all parties concerned, the matter will then be presented to the public service commission for approval and adoption and the necessary legislative appropriation sought to permit the work to proceed.

**Cincinnati, O.**—The Park Board agreed in favor of the \$40,000 bond issue passed by Council for equipment at the tuberculosis sanitarium. It was announced that the bond issuing capacity of the city is \$420,000. Of this amount the Park Board is to get \$210,000 and the hospital \$40,000, leaving a balance of \$170,000 available for other city expenses, such as sewers, street improvements, etc.

**Cleveland, O.**—Street Railway Comnr. Fielder Sanders will recommend to Council a \$5,000,000 subway bond issue. The commission advocates construction by the city of a street railway subway terminal and tube approaches to public square, to be leased and operated by the Cleveland Railway Co. as a solution of the city's traffic congestion problem.

**Cleveland, O.**—Councilman E. H. Krueger expects to ask the issuing of \$50,000 worth of bonds for a new bathhouse at Gordon Park, and Councilman Thomas W. Fleming will have a resolution to issue \$40,000 in bonds for a new bathhouse and community center on Central Ave. S. E.

**Massillon, O.**—See "Streets and Roads."

**Sandusky, O.**—County commissioners are planning on purchasing a five-ton motor truck to be used in county road maintenance work.

**Springfield, O.**—Commissioners passed an ordinance providing for the issuance of \$96,000,000 worth of bonds to pay the city's share of the public improvements

to be made during the year 1917, the bonds being issued under the authority granted at the election April 25, 1916, when the voters of the city approved the issuance of \$347,000 worth of bonds for the city's share of paving and sewer work.

**Toledo, O.**—City Engineer M. C. Clures in his annual report to service Director Goodwillie recommends that the city build a new concrete dock at the foot of Jefferson avenue and Cedar St., and that the old spring piles at the foot of Madison Ave. be replaced.

**Urbana, O.**—Addition to Court House will be built in the Spring. W. S. Coffy Aud.

**Ardmore, Okla.**—The city voted \$40,000 in fire department bonds, and \$15,000 for Fair park improvements.

**Durant, Okla.**—Bids received Feb. 6, by Chairman County Commissioners Ed. L. Spears for Court House and jail bonds, \$100,000.

**Portland, Ore.**—A. J. Welton, of the United Contracting Co., with offices in the Northwest Bank Bldg., and T. A. Garrow, engineer, are now at Riverside, Ore., figuring out a bid for constructing a big concrete dam called for in the proposed Warm Springs irrigation project, for which the Lumbermen's Trust Co., of Portland, recently bid in an issue of \$750,000 in bonds.

**Harrisburg, Pa.**—County commissioners will submit to the city council the need of a public comfort station in the basement of the Court House for consideration before final action is taken on the project to place a public comfort station in Market Square, for which \$25,000 has been voted by the city.

**Harrisburg, Pa.**—Commissioner Lynch receives descriptions and details for construction of public comfort stations from two cities. Still consideration of the local problem is being given by the commissioners, who desire to secure the services of an architect who is familiar with both the comfort station work and traffic problems.

**Wilkes-Barre, Pa.**—According to a report of engineers representing the chamber of commerce that has been submitted to the county commissioners, it will cost at least a quarter million dollars to dredge and deepen the Susquehanna River from the city line to the Nanticoke dam. It is the estimate of these engineers that it will require the removal of nearly 400,000 sq. yds. of material, loose rock, culm and other debris.

**Beaumont, Tex.**—Chamber of Commerce Committee announced a fund of \$100,000 will be raised to help finance the construction of the Beaumont-Waco railroad and site for the depot terminals and shops in the city.

**Dallas, Tex.**—City Engr. Hal Moseley submits recommendation for the big Stadium, proposed for Fair Park, at a cost of \$100,000.

**Dallas, Tex.**—See "Water Supply."

**El Paso, Tex.**—City council accepted bid of Sweet, Cansey, Foster & Co., Denver, Colo., for purchase of the \$255,000 city bonds, premium of \$9,205.50. Bidders: James N. Wright & Co., of Denver, \$8,718.70; Commerce Trust Co., of Kansas City, \$8,625; Security Trust & Savings Bank of El Paso, \$7,968.75; Estebrook & Co., of Boston, Mass., \$7,803; Kaufman, Smith, Emmett & Co., \$7,726.50; Texas Bank & Trust Co., of El Paso, \$7,293; Field Richards & Co., of Cincinnati, \$7,185; Prescott & Snyder, of Kansas City, Mo., \$7,140; J. R. Sutherland, of Kansas City, \$7,077; First National Bank of El Paso, \$7,000; Mississippi Valley Trust Co., of St. Louis, Mo., \$6,410; Stacey & Braun, of Toledo, \$6,103; Curtis Manning Co., of El Paso, \$5,102 and \$4,000; Cummins, Pruden & Co., of Toledo, \$4,853; Tillotson & Walcott Co., of Cleveland, \$1,377; Joe Kerbey of Austin, \$1,025 and lots; City National Bank  $4\frac{1}{2}$  and premium \$75.

**Fort Worth, Tex.**—Mayor E. T. Tyra stated that he contemplated the establishment of a municipal garbage incinerating plant before he retires from office in April. He is arranging to visit Abilene soon for the purpose of inspecting the city's incinerator, which is understood to have cost \$6,000. The incinerator's process is odorless and its location would not injure property. It is said. The proposed plant would not affect the city's contract with the Fort Worth Garbage Company, but would make the haul for this company shorter. Garbage hauled by the company having the city concession is carried to the dumping grounds beyond the city limits.

**Houston, Tex.**—City council, upon recommendation of the harbor board, reject-

ed the bids on the proposed warehouse at turning basin and ordered the preparation of new plans. "It would have taken more than \$500,000 to put up the building on which bids were made," said City Engineer Sands. By making the structure one instead of three stories, the cost can be reduced to about \$250,000.

**Lexington, Va.**—Bids received March 5 noon, county bonds to the amount of \$10,000.

**Petersburg, Va.**—Bids received Feb. 6 for \$250,000 improvement gold bonds. City Auditor, G. B. Gill.

**Fairmont, W. Va.**—Messrs. Weil, Roth & Co. and Seasongood & Mayor of Cincinnati jointly were successful bidders for general improvement and refunding bonds; \$760,000. J. Walter Barnes, Commissioner of Finance.

**Parkersburg, W. Va.**—For the purpose of procuring drinking fountains which are to be installed in the streets for the convenience of the public a requisition for \$200 was granted it being stated that the fountains are to cost at the rate of \$27.50 each.

**Seattle, Wash.**—Council voted to submit to the people a plan for the acquisition by condemnation or purchase of a site for the construction of a public market and cold storage plant.

**Milwaukee, Wis.**—In the 1917 budget the sum of \$60,000 has been set aside for additional bathing facilities next summer. The public works commission has been asked by the committee to make a survey and report in what manner this sum can be expended to the best advantage.

**Winnipeg, Man.**—The purchase of street cleaning apparatus is being considered by City Council. Controller Gray, chairman of the Street Commissioners, will receive prices on gasoline electric trucks. C. J. Brown, City Hall, clerk.

**Brantford, Ont.**—An application for a subway at St. Paul's Ave., under the Grand Trunk main line tracks, will be filed by the city with the Dominion Railway Commission.

**London, Ont.**—For 150,000 gallons of road oil, City Engineer H. A. Brazier will shortly call for tenders.

**St. Mary's, Ont.**—The town council will be in the market shortly for road oil. William Pulleyblank, chairman, Board of Works.

#### BIDS RECEIVED AND CONTRACTS AWARDED.

(\*Indicates Contracts Awarded.)

**Miami, Ariz.**—City council opened bids for a one-ton automobile truck as follows: Commerce, f. o. b. Globe, with driver's top, curtains, etc.; Studebaker, with express body, f. o. b. Globe, with stake body; Moreland, f. o. b. Globe, chassis only, express body added, lights and tank extra; Republic, model 10, f. o. b. Globe; G. M. C., f. o. b. Globe,  $\frac{3}{4}$  ton; Jeffery, f. o. b. Globe,  $1\frac{1}{2}$  ton.

**Peru, Ind.**—J. B. Goodall & Sons, Peru, for the construction of the new city hall which will be erected at Columbia City at \$44,737.

**Princeton, Ind.**—For construction of the Moser drain, Gibson county, to C. V. Oyen, for \$1,942.90.

**Glenwood, Ia.**—County board for the construction of the ditch which will give the waters of the Nishua Botna river a more direct flow; distance five miles; contract calls for the removal of 400,000 cu. yds. \*L. E. Sternberg of Memphis, Mo., at 7.17 cents per cubic yd.

**Cumberland, Md.**—The bond of the Union Garbage Co., A. R. Bender, manager, to whom the garbage collecting contract for the coming year has been awarded, was accepted. The amount is \$7,000.

**Passaic, N. J.**—\*John Monies, to collect ashes and garbage in Union township for three years at his bid of \$4,600.

**Buffalo, N. Y.**—\*John Feist & Sons Co., at \$6,000, by trustees of the city and county for the repairs to the city and county hall in connection with the moving of the partitions in the council chamber.

**Wilkes-Barre, Pa.**—City council let to \*Wilkes-Barre Disposal Co. a ten-year contract for the collection of garbage by the pig farm method. County for each year will pay the company the sum of \$18,500.

**Niagara Falls, Ont.**—\*Traylor Engineering Co., Allentown, Pa., by the Ontario Hydro-Electric Power Commission amounting to over \$100,000 for crusher plant. This plant will be used in connection with the new power development here.



## TOO LATE FOR CLASSIFICATION

## BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
<b>STREETS AND ROADS.</b>				
Miss.	Vicksburg	9.30 a.m., Feb. 12	Repairs to pavement	J. J. Hayes, Mayor.
Cal.	Santa Barbara	noon, Feb. 15	39,688 sq. ft. 5-in. concrete base and 1½-in. asphalt pavement; and also 28,939 sq. ft. 2-in. asphalt pavement on a 4-in. concrete base, curb and gutter, etc.	A. Christine Holmberg.
Wis.	Oshkosh	2 p.m., Feb. 19	Grading, curbing and paving 10 streets with concrete foundation and wearing surface of cement or bituminous concrete	Board of Pub. Works.
Minn.	St. Paul	10.30 a.m., Feb. 19	Resetting granite curbing, paving and repairing and street materials, including southern pine creosote wood block, 2,725 bbls. portland cement, 6,084 sq. yds. sandstone paving blocks, 48,745 lbs. pitch filler and granite curbing	H. W. Austin, Pur. Agt. King Co. Highway Comrs.
Wash.	Duvall	Feb. 26	Concrete pavement	
Idaho	Wallace	Feb. 26	Paving with standard bitulithic, 3-in. macadam base or 4-in. macadam base; concrete; Hassam; asphaltic concrete on 4-in. macadam base; or wood block	City Engr., Merrian.
<b>SEWERAGE.</b>				
Minn.	St. Paul	10.30 a.m., Feb. 19	Constructing several sewers	H. W. Austin, Pur. Agt.
Idaho	Emmett	6.30 p.m., Feb. 21	1,666 ft. 13-in. vitrified pipe and 6,254 ft. 24-in. pipe	D. M. Stokesberry, City Clk.
Iowa	Denver	2 p.m., Feb. 24	Sanitary sewer system and disposal plant, including 16,000 ft. 6 to 12-in. pipe	G. H. Bishop, Engr., Oelwein, Ia.
<b>WATER SUPPLY.</b>				
N. Y.	Schenectady	Feb. 14	Welding joints of about 10,200 ft. 36-in. lock bar steel pipe	F. J. Bates, Sec. Bd. of Contract and Supply.
O.	Alliance	Feb. 20	Waterworks improvements, including brick pumping station, concrete covered basin, hand-operated crane, cast iron pipe and specials, gate valves and boxes	J. H. McConnell, Dir. Pub. Ser.
<b>MISCELLANEOUS.</b>				
Pa.	Harrisburg	noon, Feb. 12	One gasoline 2-ton truck with power dumping device	W. H. Lynch, Supt. Streets and Public Improvements.
Conn.	New Haven	10 a.m., Feb. 13	1,000 pair license vender signs and 1,000 license badges	A. O. Pallman, City Clerk.
Mont.	Miles City	5 p.m., Feb. 26	Furnishing materials for extending underground steam heating system	Supt. Light and Power.

## STREETS AND ROADS

**San Diego, Cal.**—City to improve University Ave. and Mississippi St. with concrete sidewalks and concrete curbing. Allen H. Wright, City Clerk.

**San Diego, Cal.**—City decided to improve Landis St. with concrete sidewalks and concrete curb. Allen H. Wright, City Clerk.

**San Diego, Cal.**—City will improve with concrete sidewalks, concrete curbing Sheridan Ave. Allen H. Wright, City Clerk.

**Christopher, Ill.**—For surfacing hard roads at estimated cost about \$100,000, contracts will be awarded by city in the spring.

**Rock Island, Ill.**—Board of local improvements considering paving project in the east end, the paving of Sixth Ave. from 38th St. to 46th St., with a 40-ft. brick pavement; also for paving of Fifth and a half avenue from 25th St. to 29th St. with brick paving contemplated. A hearing on the Fifth Ave. paving will probably be boulevarded from 13th St. west to Second St.

**Anderson, Ind.**—Twelve issues Madison county highway bonds, a total of \$159,820, were awarded to J. F. Wild & Co., of Indianapolis, for \$6,722.26 premium. These are ten-year bonds and bear 4½ per cent. interest.

**Logansport, Ind.**—Four issues Cass county highway bonds in amounts of \$5,400, \$3,800, \$3,800 and \$16,500 were sold to the R. L. Dollings Co., Indianapolis, for a total premium of \$1,263.

**Muncie, Ind.**—Delaware county commissioners sold the Riley Almonrode et al., road in Monroe township to D. W. Grove, of Parker City, \$6,024.

**Boone, Ia.**—Council passed resolution to pave several streets. R. McCormick, City Engr.

**Davenport, Ia.**—According to the annual report of County Engineer J. M. Malloy, to be presented to the board of supervisors, an amount of \$72,716 is available for the improvement of the roads and bridges in Scott county during the coming year, but does not include the possible contribution from the federal aid fund. Suggests that the greater portion of the available road fund of \$24,500 be used for permanent grading, tilling, oiling and dragging of dirt

roads and the proper maintenance of the gravel and macadam roads of the county.

**Sioux City, Ia.**—Board of supervisors adopted a program calling for the construction of 12 miles of permanent roads and 40 permanent concrete bridges in 1917. The cost of the work will be well over \$100,000. The policy adopted by the board is to eliminate as nearly as possible all repair work to bridges and roads. The bridges will range in size from 70-ft. trusses to small box culverts.

**Pittsfield, Mass.**—Board of public works in their annual report to city council makes the following recommendations: New bridge at Hubbard Ave.; pavement of Melville St.; elimination of curve at Pomeroy School; extension of 18-in. water main at Mill Brook; extension of 10-in. water main at Pomeroy Ave. and Holmes road; extension of 8-in. water main in North Pearl St.; surface drain, Francis Ave. from Summer St. to Bradford St.; surface drain, Melville, First, Adam and Second Sts. to Lincoln St.; paving of Renne Ave.; Malcolm Ave. repairs, Pollock Ave. to Stratford Ave.; Walnut St. repairs; South Ave. repairs; Abbott St. repairs; Longview Terrace repairs; Mill St. paving and drain; Hurlburt St. paving; Harris St. drain and grading; South St. widening at Howard Hill; new maintenance roller; Linden St. extension repairs.

**Detroit, Mich.**—The department of public works will be forced to ask for large appropriations to carry on the program of sewer building and street paving that had been outlined by Commissioner Fennell and City Engineer Hubbell. At least \$5,000,000 of the \$16,000,000 sewer program and \$2,800,000 for resurfacing and repaving will be included in the budget which is being prepared for the consideration of the aldermen and the board of estimates. The engineer's office has sent in one item of \$2,298,000 for resurfacing alone. Of this amount \$1,237,040 is for sheet asphalt, \$1,020,590 for creosote and \$40,370 for stone. The sewer appropriation, which will go on the bond issue, will be for extensions in the newly annexed territory.

**Pontiac, Mich.**—Property owners on West Howard St. filed a petition with the city clerk, asking the commission to include in its 1917 budget an appropriation for the laying of a pavement from Saginaw St. to Baldwin Ave.

**St. Paul, Minn.**—Property owners plan to pave Concord St. from Ada to Annapolis St., about \$38,592.

**Miles City, Mont.**—County commissioners have decided to accept, on behalf of Custer county, the opportunity offered to cooperate with the war department in the creation of a military road across the U. S., to the extent of expending \$20,000 in conjunction with the \$20,000 advanced by the government, the state to pay the overhead charges and the county to maintain the road.

**Charleston, Mo.**—City plans to pave streets of business and residential section, brick and concrete.

**Omaha, Neb.**—City plans grading portions of boulevards. About \$36,000. J. Bruce, City Engr.

**Canton, O.**—County commissioners urged by Attorney John C. Welty, counsel for the N. O. T., a change in the specifications for the improvement of the Navarre Sts. along the route of the Massillon-New Philadelphia highway. Contract for macadamizing these streets was awarded by the commissioners, but no work has been started. Property owners now want brick instead of macadam.

**Lorain, O.**—City plans to pave portion 12th St. C. M. Osborne, City Engr.

**Middletown, O.**—The New First National Bank of Columbus successful bidder for the \$118,000 Butler county road bonds at \$2,843.80. Bonds issued are for improvements on the Hamilton and Scipio, Springfield, Hamilton and Middletown and Franklin roads. The work will be started this spring.

**Mingo, O.**—City plans paving Madison, Western and Garfield Ave.

**Norwood, O.**—City plans paving portion Pomeroy and Wakefield Pl. J. G. Schmidt, City Engr.

**Salem, Ore.**—State highway commission definitely provided for \$15,000 as the state's share for the New Era road. Clackamas county will appropriate \$16,000 and the federal government \$30,000.

**Salem, Ore.**—State Legislature authorized \$1,800,000 bond issue for road work.

**Harrisburg, Pa.**—According to estimates of city engineer, street intersection paving and paving on streets fronting on unassessable property will probably cost the city \$50,000 this year.

**Wilkes-Barre, Pa.**—Commissioners adopted a resolution increasing the brick

pave 211.71 sq. yds. on the Pittsion road at the Port Griffith viaduct.

**York, Pa.**—An ordinance providing for the laying out of Cortlandt St. from Boundary Ave. to Boundary alley, passed.

**Easley, S. C.**—Citizens circulating petitions asking for election to vote \$25,000 bonds for proposed paving work.

**Yankton, S. D.**—County considering constructing with concrete 5 north and south trunk highways and 2 east and west highways, including Washington highway and Meridian road; total length 140 miles. Estimated cost of 10-ft. wide pavement with 3-ft. shoulders of gravel on crushed rock, giving 16-ft. hard surface, placed at \$7,000 to \$8,000 per mile, or total expenditure of \$1,000,000 for contemplated work; if project is approved by county commissioners election to authorize bond issue will be held.

**Everett, Wash.**—Movement on foot to have Snohomish county commissioners pave gap between First St. pavement and N. P. tracks. W. C. Bickford, County Engr.

**North Yakima, Wash.**—Details of a plan for issuing \$1,500,000 Yakima county bonds in three annual installments of \$500,000 each, for the construction of 100 to 110 miles of permanent pavement on the main traveled roads of the county have been worked out by C. R. Ege, of Spokane, division engineer for the Portland Cement Assn., and this or some similar plan may be submitted to the voters for their approval.

**Olympia, Wash.**—A resolution to pave West Fourth from Water to Sylvester Sts. and to condemn Swantown property to open streets and alleys and one to build an 8-ft. walk on Main from A to C Sts. were passed by the council.

**Seattle, Wash.**—Resolutions adopted: Wilson Ave. et al., from Gratton St. to 50th Ave. So. and Hudson St., by grading; Fauntleroy Ave. et al., from W. Alaska St. to W. Hudson St., by grading; Occidental Ave. et al., from Connecticut St. to Holgate St., by paving; Fifth Ave. So. et al., from Jackson St. to Seattle Blvd., by paving, etc.; Occidental Ave. et al., from Holgate St. to Horton St., by filling, etc.

**Mondovi, Wis.**—Village voted \$49,000 for paving.

**Fond du Lac, Wis.**—Because of the probability of important changes in the road building law of the state by the current legislature, the proposal to bond Fond du Lac county for \$1,000,000 or more for the purpose of building permanent highways will be submitted to the voters at a special election to be held in the early fall, rather than at the regular election to be held in April.

**Port Moody, B. C.**—A road will be constructed by the government between Port Moody and Ioco in the near future. Further information from Mayor Griffin.

**St. Thomas, Ont.**—The good roads question was laid over until the June session of the Elgin county council.

**Toronto, Ont.**—The proposal for the construction of a sidewalk for 600 ft. on the north side of Dupont St., between Howland and Albany Aves., was defeated by the city council.

#### BIDS RECEIVED AND CONTRACTS AWARDED.

(\*Indicates Contracts Awarded.)

**Los Angeles, Cal.**—Board of public works opened bids Jan. 22 for the following work: Mariposa Ave. from the southerly line of Santa Monica Blvd. to a line parallel therewith and 599.80 ft. southerly therefrom, and a portion of Santa Monica Blvd., Romaine St. and a sewer right of way, to be improved by the construction of cement curb, cement sidewalk, concrete gutter, a vitrified pipe storm sewer, to \*Wm. Liddington, at the prices named: 32 cts. per lin. ft. for cement curb, Class A, Specifications No. 88;

10 8-10 cts. per sq. ft. for cement sidewalk, Specifications No. 84; 14 cts. per sq. ft. for concrete gutter, Specifications No. 91; \$225 for storm drain and appurtenances, complete, Specifications No. 87. Horace B. Ferris, Secy.

**Los Angeles, Cal.**—Board of public works opened bids Jan. 22 for the following work: Alley southwesterly of Eighth St., from the northwesterly line of Green Ave. to the southeasterly line of Union Ave., and that the first alley northwesterly of Green Ave., from the southwesterly line of Eighth St. to the northeasterly line of the first alley southwesterly of Eighth St.; and that the southeasterly 15.20 ft. of Union Ave., to \*Wm. Liddington at 11 7-10 cts. per sq. ft. for concrete paving, Specifications No. 101; 2 cts. per sq. ft. for grading to sub-grade, Specifications No. 101; 40 cts. per lin. ft. for cement curb, Class A, Specifications No. 88. Horace B. Ferris, Secretary.

**Dixon, Ill.**—\*Rink & Schnell, paving, \$10,000. Engr., C. F. Nesbit, care B. Grover, City Clk., City Hall.

**Michigan City, Ind.**—\*W. B. Hutchinson, a second road building contract at Mt. Clemens. Contract calls for four miles of road, costing \$10,000. The two roads to be built join, connecting Detroit and Mt. Clemens.

**St. Paul, Minn.**—\*Christ Johnson, at \$196.50, for grading of alley in Scotten's Sub. of Block 71, Lyman Dayton's addition, from Cypress St. to Earl St.

#### SEWERAGE

**Modesto, Cal.**—Bonds will be voted shortly for constructing storm sewer system. George Freitas, City Engr., preparing estimates.

**Chaska, Minn.**—City considering construction of sewage disposal plant. G. H. Gibson, Mayor.

**Toledo, O.**—George Champe, Toledo engineer, is preparing plans for a sanitary sewer and disposal plant for Albion, Ind., and Noble county, Ind.

**Engle Lake, Tex.**—Plans being prepared by John A. Norris, of Wharton, for sewerage system; cost, about \$12,000. A. M. McCarty, Mayor.

#### BIDS RECEIVED AND CONTRACTS AWARDED.

(\*Indicates Contracts Awarded.)

**Bellefontaine, O.**—\*Ray R. Albaugh, sanitary sewer, Stanton Ave., 900 ft. 8-in. vit. tile, 4 concrete manholes, \$1,000. C. A. Inskeep, Engr., Dir. Pub. Service, City Bldg.

**Niles, O.**—\*Frank George Jenkins, Arcade Bldg., Pittsburgh, Pa., intercepting sanitary sewer from Mahoning River to Mosquito Creek, at Heaton Ave., \$30,913. Engr., H. W. Turner, City Hall, Niles. Consulting Engr., Alexander Porter, 50 Church St., New York City. Homer Thomas, Clk. H. A. Burgess, Dir. Pub. Service.

#### WATER SUPPLY.

**Batesville, Ark.**—City contemplates the installation of a filtration plant.

**Fayetteville, Ark.**—City having plans prepared by Winters & Dove, Ft. Smith, for constructing settling and filtering system for city water plant.

**Gustine, Cal.**—To purchase and extend water and sewer system, city voted \$27,000.

**Hanford, Cal.**—For installing meters in all house connections of municipal water system estimates are being secured by city council.

**Lawrence, Kan.**—City commissioners and water board accepted the city water plant report of Black & Veaten, consulting engineers, approved the plans,

and instructed the engineer to draw up a detailed estimate on these plans to the extent of \$250,000, to be submitted to the water board and to the public utilities commission of the state. It is proposed by the water board to get a comprehensive set of plans for the improvement of the plant, including extensions, and a basis of future needs, and then ask for a bond issue of such an amount as will be needed for the present. A preliminary estimate places the cost of the new plant, including the construction of additional wells and the removal of the machinery of the present plant to the new location, at \$150,000.

**Monroe, La.**—City considering construction of new water works plant; cost about \$25,000.

**Pittsfield, Mass.**—See "Streets and Roads."

**Weeping Water, Neb.**—Bond issue of \$3,500 was voted on February 1 for water works improvements.

**Portland, Ore.**—L. B. Wickersham, consulting engineer, in the Chamber of Commerce Bldg., has completed plans and estimates outlining the main details of a proposed municipal water works installation for the town of Camas, Wash. No report has been received as to what decision was reached by council. It is expected that this system will cost between \$80,000 and \$100,000, requiring a pipe line several miles in length, reservoir and local distribution system.

**Dallastown, Pa.**—At the next meeting of the borough council plans will be formulated to give the citizens a chance to vote on the question of whether or not they shall increase the indebtedness of the borough by building a municipal water plant.

**Erie, Pa.**—Ordinance providing for the issue of \$850,000 worth of Mill Creek improvement bonds, for the specific purpose of building the 12,000-ft. tube, was introduced in council by Street Director W. D. Kinney and referred to committee of the whole. This is the balance of the \$950,000 issue authorized by the taxpayers at a special election last spring.

**Panhandle, Tex.**—A bond issue is contemplated for the installation of water works and light systems.

**Salem, Va.**—Town council has voted to lay a 10-in. main in Main St.

#### LIGHTING AND POWER

**Stamford, Conn.**—Street lighting committee to obtain information upon a new lighting contract will about Feb. 16 inspect Lynn, Mass., model system of types of street lighting lamps, that has been installed there by the General Electric Co. of Lynn.

**Glendive, Mont.**—There is a probability that the General Utilities Co., of Fargo, N. D., and St. Paul, Minn., owners of 17 electric light and power plants in the Central West, will extend its operations in Western North Dakota and Eastern Montana.

#### MISCELLANEOUS.

**Washington, D. C.**—Bureau of Foreign and Domestic Commerce (Dept. of Commerce).—A company in Nova Scotia is in the market for mathematical drawing instruments. About 300 sets are needed annually. Quotations should be made f. o. b. factory. Cash will be paid. Correspondence may be in English. Refer to Opportunity No. 23671.

**Logansport, Ind.**—Mayor Guthrie announced that plans were being prepared for construction of a new municipal building, at cost of \$100,000. Work will begin May 1.

**Pittsfield, Mass.**—Board of public works in their annual report to city council recommend that \$12,000 be provided for improvements of the municipal yards.

**ACTIVATED SLUDGE**  
AIR DIFFUSING PLATES  
**FILTROS**  
GENERAL FILTRATION CO., INC.  
42 East Avenue, Rochester, N. Y.

**BUCKEYE TRENCHERS**  
Cut everything but ledge rock. A perfect trench at one cut. Backed by 25 years' experience.  
Simple, Economical, Self-propelling.  
**Buckeye Traction Ditcher Co.**  
FINDLAY, OHIO



# OFFICIAL ADVERTISING

**"Reaches Most Bidders at the Least Cost"**

Rate \$2 an inch. Copy reaching us by 10 a. m.  
Thursday will go in issue mailed that night.

## 300 Tons 60-Lb.

PRACTICALLY NEW

## Steel Rails

A. R. A. Section Series  
"A." Laid but never used.  
4½" high, with angles.  
Don't overlook this opportunity to secure  
New Rails at less than mill cost and for im-  
mediate shipment.

Consult us  
Before buying or selling LOCOMO-  
TIVES, CARS, EQUIPMENT, MA-  
CHINERY, TANKS, etc.



First Nat'l Bk., Chicago Hennen Bldg., New Orleans  
Main Office: 325 Locust, St. Louis

## WANTED

10 ton Macadam Roller for im-  
mediate delivery. Must be in  
good shape. Will pay cash if  
price is right.

Municipal Journal, Box 990.  
56 Union Square, N. Y. City

## TRANSITS AND LEVELS RENTED OR SOLD EASY TERMS

THE ENGINEERING AGENCY, Inc.  
3 West Jackson St. Chicago

## Proposal.

For Welding Joints of a 36" Lock-Bar Steel  
Pipe Line.

Schenectady, N. Y.

Sealed proposals will be received by the Board  
of Contract and Supply of the City of Schenec-  
tady, N. Y., until 2:30 P. M., Wednesday, Febru-  
ary 14, 1917, for furnishing all labor, materials  
and equipment and welding circumferential  
joints of approximately 10,200 feet of 36" Lock-  
Bar Steel Pipe.

The pipe is made from 5/16" and 3/8" plate  
and has approximately 387 single riveted lap  
joints to be welded, of which 137 are on the  
5/16" plate and 244 on the 3/8" plate.

Pipe has been laid two years and has an  
average cover of 3½ feet, but has never been  
in service.

Specifications may be obtained from the Sec-  
retary of the Board of Contract and Supply,  
City Hall Annex, Schenectady, N. Y.

Each proposal must be accompanied by a  
certified check to the amount of 5% of the sum  
of the bid.

Both a construction and maintenance bond  
will be required.

The Board reserves the right to reject any  
and all bids.

BOARD OF CONTRACT AND SUPPLY,  
F. J. Bates, Secretary.

## Bids Wanted.

Sealed bids will be received by the town of  
Denver, Iowa, until 2 o'clock P. M. on the  
24th of February, for the construction of sani-  
tary sewer system and disposal plant. About  
16,000 ft. of 6" to 12" pipe will be laid. Plans  
and specifications may be obtained from G. H.  
Bishop, Civil Engineer, Oelwein, Iowa, upon  
deposit of \$5.00.

F. T. FARNSWORTH, Clerk.

## Bids Wanted.

The Public Service Commission, Yazoo City,  
Miss., will receive bids for one 500 and for one  
300 kilowatt A.C. generator and engine or tur-  
bine with necessary condenser and other acces-  
sories, until 11:00 A. M., Tuesday, February  
20th, 1917. Right is reserved to reject any or  
all bids.

Specifications may be had on request.

JAS. S. BUTLER, Superintendent.

## FOR SALE

10 ton Macadam Roller. Good  
shape, bargain. Continental  
Good Roads Co., Box 492,  
Albany, N. Y.

## NOTICE.

The City Council of Great Falls, Montana,  
will receive Sealed Bids until 8 o'clock P. M.,  
Tuesday, February 20th, for a Motor-Driven  
Combination Street Sprinkler and Sweeper. Bid-  
ders to furnish views and full description of  
their respective machines. All bids to be  
F.O.B. Great Falls, and addressed to W. H.  
HARRISON, City Clerk.

The Council reserves the right to reject any  
and all Bids.

TREASURY DEPARTMENT, Supervising  
Architect's Office, Washington, D. C., January  
30, 1917.—Sealed proposals will be opened in this  
office at 3 p. m., March 14, 1917, for the construc-  
tion of the United States post office at States-  
boro, Ga. Drawings and specifications may be  
obtained from the custodian of the site at  
Statesboro, Ga., or at this office, in the discre-  
tion of the Supervising Architect. Jas. A.  
Wetmore, Acting Supervising Architect.

## OFFICE OF THE STATE COMMISSION OF HIGHWAYS, ALBANY, N. Y.

Sealed Proposals will be received by the  
undersigned at their office, No. 55 Lancaster  
Street, Albany, N. Y., at 1 o'clock P. M. on  
Monday, the 19th day of February, 1917, for  
the construction of highways in the following  
counties:

ALBANY (one highway—1.45).  
BROOME (two highways—5.35; 6.93).  
CHAUTAUQUA (one highway—4.19).  
CHENANGO (one highway—7.12).  
CLINTON (one highway—5.95).  
COLUMBIA (one highway—5.02).  
CORTLAND (one highway—2.33).  
ERIE (four highways—3.54; 0.91; 2.97; 5.26).  
ESSEX (one highway—4.95).  
FULTON (one highway—2.80).  
HAMILTON (one highway—6.82).  
HERKIMER (one highway—5.84).  
\*MONROE (one highway—2.73).  
MONTGOMERY (one highway—3.63).  
NIAGARA (one highway—0.61).  
ONEIDA (two highways—6.15; 5.74).  
OSWEGO (one highway—5.63).  
RENSSELAER (one highway—6.34).  
SARATOGA (one highway—9.06).  
ULSTER (one highway—1.80).  
WARREN (one highway—4.59).  
WESTCHESTER (one highway—1.09).

\*JEFFERSON (one highway, completion—4.60).  
Sealed Proposals will also be received at  
1 o'clock P. M. on Tuesday, February 20th,  
1917, for the improvement of the following  
highways:

BROOME (two highways—3.78; 4.08).  
CLINTON (one highway—3.34).  
ERIE (four highways—2.90; 3.02; 2.34; 5.78).  
ESSEX (one highway—8.85).  
FULTON (one highway—4.90).  
HAMILTON (one highway—6.74).  
HERKIMER (one highway—5.67).  
MONROE (one highway—4.58).  
MONTGOMERY (one highway, completion—  
5.66).

NASSAU (one highway—2.99).  
ONEIDA (two highways—0.45; 1.05).  
OTSEGO (one highway—4.09).  
RENSSELAER (one highway—4.95).  
ROCKLAND (one highway—0.24).  
ST. LAWRENCE (one highway—4.60).  
SCHENECTADY (one highway—3.42).  
SCHOHARIE (one highway—5.25).  
SENECA (one highway—0.05).  
SUFFOLK (one highway—11.58).  
TOMPKINS (one highway—2.46).  
ULSTER (one highway, completion—1.85).  
WAYNE (one highway—1.88).

Also Broken Stone Contract No. 73, Onon-  
daga and Wayne Counties—approx. 5,900 tons.

Maps, plans, specifications and estimates may  
be seen and proposal forms obtained at the  
office of the Commission in Albany, N. Y., and  
also at the office of the Division Engineers in  
whose division the roads are to be improved.  
The addresses of the division engineers and  
the counties in which they are in charge will  
be furnished on request.

The especial attention of bidders is called  
to "GENERAL INFORMATION OF BIDDERS"  
on the itemized proposal, specifications and  
contract agreement. EDWIN DUFFEY,  
L. J. MORRIS, Commissioner.

Secretary.

Dallas, Tex.—Proposed franchise for  
the Dallas Automatic Telephone Com-  
pany will go to the voters for approval  
at the city election April 3 without a  
final valuation upon the property of the  
telephone company was announced by  
Mayor Henry D. Lindsley. The plan has  
been agreed upon by the City Commis-  
sion and the telephone company.

St. John, N. B.—Consideration is being  
given various types of stationary en-  
gines with a view to deciding on a 50-  
horse-power unit for the asphaltting  
plant. Commissioner P. W. D., G. F.  
Fisher.

Hamilton, Ont.—E. R. Gray, city engi-  
neer, will call for tenders in February  
for the building of a subway from Dun-  
durn Park to Bay Shore, to cost \$20,000.  
City clerk, S. H. Kent.

Hamilton, Ont.—The City Council con-  
templates repairs to wharf at Wabasso  
Park. Chairman, Geo. Wild, 558 Barton  
St. E. Work to start in the spring.

# BUYERS' CLASSIFIED DIRECTORY

of Names and Addresses of the Most Reliable Firms from Whom to Buy Materials  
Appliances and Machinery Needed by Municipal Departments and Contractors

## Cement

Allentown Portland Cement Co., Allentown, Pa.  
\*Alpha Portland Cement Co., Easton, Pa.  
Atlas Portland Cement Co., 30 Broad St., N. Y.  
\*Lehigh Portland Cement Co., Allentown, Pa.

## Contractors' Equipment

(See Paving Machinery also.)

**AIR COMPRESSING PLANTS (Portable).**  
\*Gardner Governor Co., Quincy, Ill.

**DUMPING BUCKETS.**  
Stuebner, G. L., Iron Works, Hancock St.,  
Long Island City.

**LOCOMOTIVE CRANES.**  
\*Brown Hoisting Machinery Co., Cleveland, O.

**MOTOR TRUCKS, DUMPING.**  
\*General Motor Truck Co., Pontiac, Mich.  
\*General Vehicle Co., Long Island City, N. Y.  
\*Kissel Motor Car Co., 570 Kissel Ave.,  
Hartford, Wis.  
\*White Co., Cleveland, Ohio.

**PUMPS, DIAPHRAGM.**  
\*Parker, A. A., Waterford, N. Y.

## Drawing Materials

**BLUE PRINTS AND PAPER.**  
New York Blue Print Paper Co., 58 Reade St.,  
New York.

## Fire Dept. Equipment

**AERIAL TRUCKS.**  
\*Boyd, James, & Bro., 25th and Wharton Sts.,  
Philadelphia, Pa.

**COMBINATION CHEMICAL AND HOSE  
WAGONS.**

\*American-La France F. E. Co., Elmira, N. Y.  
\*Boyd, James, & Bro., 25th & Wharton Sts.,  
Philadelphia, Pa.  
\*Kissel Motor Car Co., 570 Kissel Ave.,  
Hartford, Wis.

**FIRE ALARM SYSTEMS.**  
\*Loper Fire Alarm Co., Stonington, Conn.

**FIRE ALARM TELEGRAPH.**  
\*Gamewell Fire Alarm Telegraph Co.,  
Grand Central Terminal, N. Y.

**FIRE HOSE.**  
\*Eureka Fire Hose Co., 27 Barclay St., N. Y.  
\*Fabric Fire Hose Co., Duane & Church Sts.,  
New York.

**FIRE PROTECTORS.**  
\*Kessler Safety Device Co., 6305 South Peoria  
St., Chicago, Ill.

**GASOLINE STORAGE SYSTEMS.**  
\*Bowser, S. F. & Co., Inc., Fort Wayne, Ind.

**PUMPING ENGINES, GASOLINE.**  
\*American-La France F. E. Co., Elmira, N. Y.

**RUBBER TIRES.**  
\*Goodyear Tire & Rubber Co., Akron, O.  
\*U. S. Tire Co., Broadway & 58th St., New  
York.

**TRACTORS.**  
\*Couple Gear Freight Wheel Co.,  
Grand Rapids, Mich.

**TRIPLE COMBINATION MOTOR.**  
\*American-La France F. E. Co., Elmira, N. Y.

## Paving Machinery

**ASPHALT PLANTS.**  
\*Cummer & Son Co., F. D., Cleveland, O.  
\*East Iron & Machine Co., Lima, O.  
\*Hetherington & Berner, Indianapolis, Ind.  
\*Warren Bros. Co., Boston, Mass.

**BRICK CONVEYERS.**  
\*Mathews Gravity Carrier Co., Elwood City,  
Pa.

**BRICK TESTING MACHINES.**  
\*Hetherington & Berner, Indianapolis, Ind.

**CONCRETE MIXERS.**  
\*Ransome Concrete Machinery Co., 115 Broad-  
way, New York.

**OIL DISTRIBUTORS.**  
\*Austin Western Road Mach. Co., Chicago, Ill.  
\*Kinney Mfg. Co., 3535 Washington St.,  
Boston, Mass.

**ROAD GRADERS.**  
\*Austin-Western Road Mach. Co., Chicago, Ill.

**ROAD ROLLERS.**  
\*Austin-Western Road Mach. Co., Chicago, Ill.  
\*Buffalo Springfield Roller Co., Springfield, O.

**SAND SPREADERS.**  
\*Kindling Machinery Co., Milwaukee, Wis.

**SCRAPERS.**  
\*Austin-Western Road Mach. Co., Chicago, Ill.

**TAR KETTLES, ASPHALT HEATERS,  
ETC.**

\*Littleford Bros., Cincinnati, O.  
\*Warren Bros. Co., 142 Berkeley St., Boston.

## Paving Materials

**ASPHALT.**  
\*Bitoslag Paving Co., 90 West St., New York.  
\*Pioneer Asphalt Co., Lawrenceville, Ill.  
\*Standard Oil Co., 26 Bway, New York, N. Y.  
\*Standard Oil Co., 72 W. Adams St., Chicago.  
\*U. S. Asphalt Refining Co., 90 West St., N. Y.

**BINDERS.**  
\*Baker, John, Jr., 17 Battery Pl., New York.  
\*Barrett Co., The, 17 Battery Pl., N. Y.  
\*Headley Good Roads Co., Thirtieth & Spruce  
Sts., Philadelphia, Pa.  
\*Pioneer Asphalt Co., Lawrenceville, Ill.  
\*Robeson Process Co., 18 E. 41st St., N. Y.  
\*Standard Oil Co., 26 Broadway, N. Y.  
\*U. S. Asphalt Refining Co., 90 West St., N. Y.

**BITUMINOUS PAVEMENTS.**  
\*Amies Road Co., Easton, Pa.  
\*Bituminized Road Co., Kansas City, Mo.  
\*Barrett Co., The, 17 Battery Pl., N. Y.  
\*Warren Bros. Co., 142 Berkeley St., Boston.

**BRICK.**  
\*The Barr Clay Co., Streator, Ill.  
\*Clearfield Brick Mfg. Co., Clearfield, Pa.  
\*Clydesdale Brick & Stone Co., Oliver Bldg.,  
Pittsburgh, Pa.  
\*Metropolitan Paving Brick Co., Canton, O.  
\*Schuykill Valley Vitriified Products Co.,  
Oaks, Montgomery County, Pa.  
\*Terre Haute Vitriified Brick Co., Terre  
Haute, Ind.  
\*Thornton Fire Brick Co., 909 Goff Bldg.,  
Clarksburg, W. Va.

## EXPANSION JOINTS.

\*Barrett Co., The, 17 Battery Pl., N. Y.  
\*Carey Mfg. Co., Philip, Lockland, Cinn., O.  
\*Pioneer Asphalt Co., Lawrenceville, Ill.  
\*Asbestos Protected Metal Co., Pittsburgh, Pa.  
\*Trussed Concrete Steel Co., Youngstown, O.

**JOINT PROTECTION (CONCRETE).**  
\*Trussed Concrete Steel Co., Youngstown, O.

## OIL.

\*Baker, John, Jr., 17 Battery Pl., N. Y.  
\*Barrett Co., The, 17 Battery Pl., N. Y.  
\*Pioneer Asphalt Co., Lawrenceville, Ill.  
\*Standard Oil Co., 26 Broadway, N. Y.  
\*U. S. Asphalt Refining Co., 90 West St., N. Y.

## ROCK ASPHALT.

\*Republic Creosoting Co., Indianapolis, Ind.  
\*Wyckoff Pipe & Creosoting Co., 30 E. 42d St.,  
New York.

## Public Lighting

**INSULATED WIRES AND CABLES.**  
\*Okonite Co., 253 Broadway, N. Y.

## Scientific Instruments

**ENGINEERS' TRANSITS AND LEVELS.**  
\*Buff & Buff, Jamaica Pl. Sta., Boston, Mass.  
\*Heller & Brightly, 1124 Spring Garden, Phila-  
delphia, Pa.

**PYROMETERS.**  
\*Thwing Instrument Co., 3339-41 Lancaster  
Ave., Philadelphia, Pa.

## Sewerage

**PIPE (CAST IRON).**  
\*Central Foundry Co., 90 West St., N. Y. City.

**PIPE CLEANING MACHINES.**  
\*Champion Potato Machinery Co., 332 Shef-  
field Ave., Hammond, Ind.  
\*Stewart, W. H., 1614 Locust St., St. Louis.

**PIPE JOINT COMPOUND.**  
\*Superior Chemical Co., St. Louis, Mo.  
\*Pacific Flush Tank Co., 149 Broadway, N. Y.

## SEWAGE DISPOSAL.

**EJECTORS.**  
\*Pacific Flush Tank Co., 149 Broadway, N. Y.

**FORMS.**  
\*Northwestern Steel & Iron Wks., Eau Claire,  
Wis.

**NOZZELS.**  
\*Pacific Flush Tank Co., 149 Broadway, N. Y.

**SIPHONS AND FLUSH TANKS.**  
\*Pacific Flush Tank Co., 149 Broadway, N. Y.

**VITRIFIED FIRE CLAY SEWER TILE.**  
East Ohio Sewer Pipe Co., Irondale, O.  
\*National Fire Proofing Co., Pittsburgh, Pa.

## Street Cleaning AND REFUSE DISPOSAL

**FLUSHERS.**  
\*American Car Sprinkler Co., Worcester, Mass.  
\*General Motors Truck Co., Pontiac, Mich.  
\*General Vehicle Co., Long Island City, N. Y.

\*Advertisers—See Alphabetical Index on last white page.